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# HOUSE DOCUMENTS

VOL. 3

WASHINGTON : : GOVERNMENT PRINTING OFFICE : : 1906

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# ANNUAL REPORTS

OF THE

# WAR DEPARTMENT

FOR THE

FISCAL YEAR ENDED JUNE 30, 1905.

## VOLUME II.

## ARMAMENT, TRANSPORTATION, AND SUPPLY.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1905.

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# ARRANGEMENT OF THE ANNUAL REPORTS OF THE WAR DEPARTMENT FOR THE YEAR ENDED JUNE 30, 1905.

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**Volume I**............Secretary of War:
- Chief of Staff.
- The Military Secretary.
- Inspector-General.
- Judge-Advocate-General.

**Volume II**........**Armament, Transportation and Supply:**
- Quartermaster-General.
- Commissary-General.
- Surgeon-General.
- Paymaster-General.
- Chief of Engineers, Military Affairs.[a]
- Chief of Ordnance.[b]
- Chief Signal Officer.
- Chief of Artillery.
- Board of Ordnance and Fortification.

**Volume III**......**Division and Department Commanders:**
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  2. Department of the Gulf.
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**Volumes X-XIV**....The Chief of the Bureau of Insular Affairs, the Philippine Commission, and Acts of the Philippine Commission.

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[a] Printed in Report of Chief of Engineers, Vol. V.
[b] Printed in Report of Chief of Ordnance, Vol. IX.
[c] Printed as Appendix B in Report of Secretary of War, Vol. 1.

Nov. 7. 1908

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# REPORT OF THE QUARTERMASTER-GENERAL.

V

# REPORT OF THE QUARTERMASTER-GENERAL.

War Department,
Office of the Quartermaster-General,
*Washington, September 30, 1905.*

Sir: I have the honor to submit the annual report of the operations of the Quartermaster's Department for the fiscal year ended June 30, 1905:

### FINANCIAL STATEMENT.

| | | |
|---|---|---|
| By acts of Congress approved April 23 and 28, 1904, and March 3, 1905, there was appropriated for the regular service of the Quartermaster's Department for the fiscal year ended June 30, 1905, the sum of | | $33,177,822.50 |
| During the fiscal year there was deposited to the credit of appropriations, 1905, amounts received from sales to officers, etc | | 1,555,779.89 |
| During the fiscal year there was deposited to the credit of appropriations, 1905, by Treasury transfer warrants | | 354,912.00 |
| Making a total of | | 35,088,514.39 |
| Of this there was remitted to disbursing officers | $27,107,177.83 | |
| There was paid out on account of settlements made at the Treasury of claims and accounts | 48,607.09 | |
| | | 27,155,784.92 |
| Leaving a balance on hand July 1, 1905, available for payment of outstanding obligations incurred or fulfillment of contracts properly entered into within the fiscal year of | | 7,932,729.47 |
| On July 1, 1904, there was on hand from the regular appropriations of the Quartermaster's Department pertaining to the fiscal year ended June 30, 1904 | | 5,792,468.41 |
| And from appropriations "Barracks and quarters, 1903 and 1904" and "Equipment of officers' schools, military posts, 1903 and 1904" | | 520,474.46 |
| And from appropriation "Shooting galleries and ranges, 1904 and 1905" | | 16,500.00 |
| And from appropriation pertaining to previous fiscal years the sum of | | 12,122,027.13 |
| And from appropriations for special and indefinite purposes, certified claims, etc | | 2,834,992.61 |
| Making a total balance on hand of these appropriations of | | 21,286,462.61 |
| For specific purposes there was appropriated during the fiscal year ended June 30, 1905 | $2,551,373.46 | |
| During the year there was deposited and transferred to credit of appropriations other than those of 1905, as shown above, including the sum of $156,201.14 for Pacific railroads for the year 1902 and prior years, 1903, 1904, and 1905; and also the sum of | | |

| | | |
|---|---|---|
| $34,029.55 for barracks and quarters, 1903 and 1904; and $3,488.85 for equipment of officers' schools, military posts, 1903 and 1904; also $644 for shooting galleries and ranges, 1904 and 1905, and $9.38 for military roads and bridges, Alaska, 1900 and 1901 | $2,706,834.91 | |
| | | $5,258,208.37 |
| Making a total on hand from these appropriations of | | 26,544,670.98 |
| Of said amounts there was remitted to disbursing officers the sum of | $9,563,807.93 | |
| There was paid out on account of Treasury settlements | 670,899.24 | |
| There was charged against appropriations by Treasury transfer warrant | 350,000.00 | |
| There was carried to the surplus fund | 11,499,591.08 | |
| | | 22,084,298.25 |
| Leaving balance on hand July 1, 1905, of | | 4,460,372.73 |

### RECAPITULATION.

| | |
|---|---|
| Remitted to officers and paid out on Treasury settlements for the regular service of the Quartermaster's Department for the fiscal year ended June 30, 1905 | $27,155,784.92 |
| From appropriations previous fiscal years, and from indefinite appropriations, and charged against said appropriations by Treasury transfer warrants | 10,584,707.17 |
| Total | 37,740,492.09 |
| Balance remaining in Treasury July 1, 1905, of appropriations for the regular service of the Quartermaster's Department for the fiscal year ended June 30, 1905 | 7,932,729.47 |
| And of appropriations for previous fiscal years and for indefinite and special appropriations | 4,460,372.73 |
| Total | 12,393,102.20 |

### PHILIPPINE ISLANDS.

The following amounts were remitted to the Philippine Islands during the fiscal year:

| | |
|---|---|
| Regular supplies | $529,800.00 |
| Incidental expenses | 378,500.00 |
| Barracks and quarters | 4,178.38 |
| Transportation of the Army and its supplies | 3,662,597.00 |
| Clothing and camp and garrison equipage | 34,000.00 |
| Construction and repair of hospitals | 16,150.00 |
| Shooting galleries and ranges | 2,335.38 |
| Military post exchanges | 24,200.00 |
| Bringing home remains of officers and soldiers | 22,000.00 |
| Military post, Manila, P. I | 450,000.00 |
| Barracks and quarters, Philippine Islands | 350,000.00 |
| Total | 5,473,760.76 |

### CONSTRUCTION AND REPAIRS.

The following statement shows the various appropriations specifically for construction work, the amount appropriated by Congress under each for the fiscal year or remaining available from continuing appropriations, the total allotments made therefrom for construction and repairs, and the balances remaining unallotted on June 30, 1905:

| Appropriation. | Amount appropriated. | Total allotted. | Unallotted balance. |
|---|---|---|---|
| Barracks and quarters | $4,750,000.00 | $4,721,711.12 | $28,288.88 |
| Military posts | 1,513,987.98 | 1,348,963.79 | [a] 165,024.19 |
| Hospitals | 380,000.00 | 377,177.02 | 2,822.98 |
| Hospital stewards' quarters | 15,000.00 | 14,811.13 | 188.87 |
| Military post exchanges | 500,000.00 | 499,266.98 | 733.02 |
| Shooting galleries and ranges | 62,000.00 | 60,503.07 | 1,496.93 |
| Barracks and quarters, Philippine islands | 603,071.60 | 475,376.29 | [a] 127,695.31 |
| Military post, Manila | [b] 465,301.58 | 387,340.42 | [a] 77,961.16 |
| Military post, Fort Sheridan | 280,000.00 | 256,696.20 | [a] 23,303.80 |
| Military post, Fort Snelling | 125,000.00 | 106,691.20 | [a] 18,308.80 |
| Presidio of San Francisco: | | | |
| Improvements, reservation | 15,000.00 | 15,000.00 | ............ |
| Road to national cemetery | 5,000.00 | 5,000.00 | ............ |
| Total | 8,714,361.16 | 8,268,537.22 | 445,823.94 |

[a] Indefinite appropriations. Balances available for use during ensuing fiscal years.
[b] Balance available July 1, 1904, from appropriations of $1,500,000 previously made.

In addition to the above there have been allotted for construction purposes from the general appropriations of the Department the following:

| | |
|---|---|
| Army transportation: For installation and repair of plumbing, water systems and sewer systems; construction and repair of roads, walks, and wharves | $2,217,671.77 |
| Regular supplies: For installation and repair of heating and lighting systems, construction and repair of fences, and construction and repair of bakeries and ovens | 807,639.19 |
| Incidental expenses: For flagstaffs, box lockers, refrigerators, etc | 85,998.27 |
| Total expended or allotted from general appropriations | 3,111,309.23 |
| Total allotted from specific appropriations | 8,268,537.22 |
| Grand total | 11,379,846.45 |

## MILITARY POST EXCHANGES.

The work of continuing the construction, equipment, and maintenance of suitable buildings at military posts and stations for the conduct of the post exchange, school, library, reading, lunch, and amusement rooms and gymnasium has progressed in line with the other construction work. Following is an itemized statement of expenditures from appropriation of $500,000 made for the fiscal year 1905:

| Fort. | How expended. | Amount. |
|---|---|---|
| Des Moines, Iowa | Construction post exchange | $34,128.00 |
| Slocum, N. Y | do | 20,282.00 |
| Mackenzie, Wyo | Construction post exchange (additional) | 9,817.50 |
| McKinley, Me | Construction post exchange | 22,019.00 |
| Lawton, Wash | do | 20,701.00 |
| Jefferson Barracks, Mo | do | 36,928.00 |
| Totten, N. Y | do | 26,507.00 |
| Madison Barracks, N. Y | do | 34,337.51 |
| Ringgold, Tex | Purchase post trader's building | 2,200.00 |
| Davis, Alaska | Purchase gymnastic apparatus | 639.35 |
| McIntosh, Tex | Construction post exchange | 15,975.00 |
| Monroe, Va | do | 33,967.00 |
| Robinson, Nebr | Conversion hospital to post exchange | 6,527.00 |
| Logan H. Roots, Ark | Construction post exchange | 22,765.00 |
| Moultrie, S. C | do | 20,447.00 |
| Caswell, N. C | do | 10,197.00 |
| Washington, Md | do | 23,874.00 |
| Missoula, Mont | do | 17,347.00 |
| St. Michael, Alaska | Labor on post exchange | 1,078.33 |
| Howard, Md | Construction post exchange | 21,885.00 |
| Ontario, N. Y | do | 29,202.50 |
| Worden, Wash | do | 17,807.00 |
| Philippine Islands | For construction, etc | 24,200.00 |
| Allotted for miscellaneous repairs, enlargements, and renewal of worn-out equipment | | 42,484.94 |
| Purchase of gymnastic apparatus | | 3,950.85 |
| Total | | 499,266.98 |

From the inauguration of this work by the appropriation of $500,000 in the act of June 3, 1902, to June 30, 1905, $1,500,000 has been appropriated by Congress and expended thereon. For the current fiscal year $333,500 was appropriated, which will be used, making a total of $1,833,500, and $350,000 more has been estimated for the coming fiscal year, 1907, with which to carry the work to completion as nearly as possible.

The buildings constructed have been planned to meet all the purposes proposed by the act establishing them, and are conveniently arranged and furnished to this end. It is my opinion, however, that the gymnastic equipment is unnecessarily elaborate, comprising, as it does, almost everything in the way of modern apparatus for athletic training, most of which the enlisted men will not use without compulsion, which commanding officers will not apply. It would be better if the athletic equipment were confined to a few of the simpler apparatus in common use and bowling alleys provided, as they not only furnish excellent physical exercise but the attractions of healthful sport, and are very much desired by and desirable for the enlisted men.

## INCREASING COST OF CONSTRUCTION.

In connection with the cost of construction and repairs it should be remembered that the modern permanent military posts, with their many and large buildings, elaborately finished and equipped, extensive heating, lighting, water, and sewer systems, and in case of the coast-artillery posts the addition of motor plants, searchlights, boathouses, wharves, etc., differ widely from and are far more costly than the more or less temporary frontier posts occupied by the Army to within the last few years. Not only must these factors in the cost of building and maintaining our military posts be considered, but the increased and advancing cost of all material and labor entering into their construction as well. Contracts already awarded for construction from funds of the current fiscal year (1906) show an increased cost over prices paid during the fiscal year 1905 of about 12 per cent, with indications of a continual rise. This, as before stated, is due to the increased cost of building materials, especially the higher grades of lumber of all kinds, and to the increased cost of labor. For the past three years there has been a steady increase in the cost of construction, due to the causes mentioned, until it is now estimated that the cost is approximately 36 per cent more than three years since, and from present indications there is every reason to expect a continuance of this advance.

The cost of heavy timbers required for girders, and of durable lumber for outside, and high-grade material for floors and interior finish, renders it advisable to give consideration to adoption of concrete and iron construction in large permanent buildings, such as barracks, storehouses, guardhouses, etc. The first cost under this method of construction would be considerably greater than for the class of buildings now in general use, but the increased durability of buildings erected under present systems of adoption of iron and concrete would in the end fully compensate for the additional outlay.

### REPAIRS AT OLD POSTS.

When the buildings now under construction and those which will yet be provided for from allotments made from current fiscal year's appropriations are completed, there will be sufficient accommodations at military posts in the United States for the cavalry, field artillery, and infantry troops now serving in this country, and further large appropriations for construction of new posts for troops of those arms of the service will not be required unless some of the old posts (temporary) now occupied are abandoned.

There are, however, a number of garrisoned posts which were originally established and built thirty and more years ago with material and under methods of construction less substantial than now in use. The buildings at these posts have outlived their usefulness, and, aside from being cramped, inconvenient, uncomfortable, and in some cases insanitary, are in such dilapidated condition as to require large annual allotments to keep them in sufficient repair to be habitable. As long as these posts are occupied by troops the old buildings must be kept up, and the expense of doing so is a heavy drain upon the annual appropriations for barracks and quarters. Even with the repairs and renovations constantly made at posts of this class conditions there are not satisfactory on account of the very great contrast between the accommodations afforded as compared with those at new posts, and this comparison is a source of much dissatisfaction among officers and enlisted men.

Such of these old posts as from their situations or for other reasons are no longer needed should be definitely abandoned as soon as provisions can be made elsewhere for the troops now occupying them, so that the cost of keeping them in repair will be saved. Those which are to be retained should, in the interests of economy if for no other consideration, be rebuilt on modern lines as rapidly as practicable. The work of reconstructing old posts is now in progress on lines above suggested at Fort Clark, Tex.; Fort Douglas, Utah; Madison Barracks, N. Y.; Fort Meade, S. Dak.; Omaha, Nebr.; Fort Slocum, N. Y.; Vancouver Barracks, Wash.; Walla Walla, Wash.; Whipple Barracks, Ariz.; Fort Wingate, N. Mex., and Fort Wood, N. Y. Sufficient appropriations to continue this work until all the old buildings which have reached the limit of serviceableness have been replaced by new ones should be made.

Among posts which should be either abandoned or rebuilt in whole or in part, if they are to be permanently retained, may be mentioned: Benicia Barracks, Cal.; Forts Keogh, Mont.; Mason, Cal.; McDowell, Cal.; Missoula, Mont.; Niobrara, Nebr.; the Presidio of San Francisco, Cal.; Forts Reno, Okla.; Robinson, Nebr.; Sill, Okla., and Washakie, Wyo.

### APPROPRIATIONS FOR SPECIFIED CONSTRUCTION.

Congress having in the Army appropriation act approved April 23, 1904, under "Construction and repair of hospitals" inserted a clause authorizing $40,000 "to build a modern hospital at Fort Riley, Kans.," the question arose as to just what expenses of construction it was the intent of Congress should be paid from this sum. It was my opinion that such appropriations were expected and intended by Congress to cover expenditures for construction and completion of the building in all essential respects, and all expenses a part of or incident to the construction of buildings so appropriated for should come out of and fall within the amount designated in the appropriation, thus including permanent heating plants, electric lighting systems, and plumbing fixtures for such buildings. In many cases where special appropriations have been asked and obtained for particular buildings or classes of buildings this office has not been consulted as to the cost of the items mentioned, has not therefore estimated for funds for the purposes under the general appropriations, and finds itself embarrassed in carrying out projects for which it had estimated and been given appropriations.

Upon the question being submitted to the Comptroller of the Treasury, however, that official decided on June 14, 1905, that the cost of heating apparatus must not be included, as it is specifically provided for in the appropriation for "Regular supplies," a provision that originally contemplated only stoves or similar apparatus, not the elaborate modern systems, integral parts of the structures; and further that as no specific mention was made in this appropriation of plumbing and electric wiring, these might probably be considered necessary items for the construction of a modern hospital and included in the limited cost of $40,000. The line of reasoning is not clear, as the appropriation "Regular supplies" provides for the supply of lights for various purposes and where electricity is used the wiring is as much a necessary part thereof as are lamps where mineral oil is used. "Regular supplies" never has been used for plumbing, that is provided for in the appropriation for "Transportation of the Army" and just as clearly as heating apparatus under "Regular supplies."

The permanent heating plants, electric wiring, or gas-piping systems and plumbing fixtures are actually parts of the building and so considered and treated in most modern construction, and it is believed that where Congress has appropriated a specific sum for a designated building it was in the minds of the members that all such items would be paid from the sum so appropriated, and it is recommended that for appropriations of that character, if such is the understanding, it be made clear. This is believed to be in accordance with the general rule that where a special appropriation is made for a specific purpose it prohibits the use of any part of a general appropriation for the whole or a part of the purpose. It is hoped that Congress will decide this matter at its next session.

The position here outlined is held by this office in the use of its appropriations for post exchanges, and the language of the appropriation has been made clear, covering the entire construction and equipment of these buildings for the purposes designed.

## GENERAL HOSPITALS.

The same view as set out above is entertained with reference to the general hospitals conducted by the Medical Department separately from military posts, as in the case of the Army and Navy General Hospital at Hot Springs, Ark., the general hospital at Fort Bayard, N. Mex., and will be with the new one to be built at Washington, D. C., or independent of the military post, as in the case of the general hospital at the Presidio of San Francisco, Cal., and Washington Barracks, D. C.

These are hospitals exclusively, and it is believed that none of the appropriations made for the shelter of troops and supplies should be drawn upon for their construction, repair, or equipment. Every building at each of these places is as much a part of a hospital as though it were, at a post, one of a number of rooms under one roof, and, especially at Hot Springs and Fort Bayard, where other than army patients may upon payment of proper fees be received. It is believed that Congress in appropriating for these institutions intended that they should be built, equipped, and maintained entirely aside from the appropriations for construction, etc., at posts, but custom and decisions have brought about a condition which imposes a considerable portion of their expense upon the appropriations of this Department for construction of buildings at posts. The law ought to make clear the intent of Congress and place the entire cost of these institutions in one fund, that it may be known what sums are annually required for them, and also much simplify the matter of handling appropriations therefor.

They are valuable institutions, performing important work of a nature that could be handled in no other way and the service they have rendered and will continue to render under the efficient administration of the Medical Department is of incalculable benefit, so that the sums appropriated for their use should be liberal. But it will in no way impair their value to so change the wording of appropriations for their use as to require all expenditures for them to be made as Congress is believed to now understand them to be, and dispense with observances of a lot of confusing and conflicting decisions and erroneous customs. Either this should be done or this Department's appropriations increased to meet the cost of these items for such buildings.

## REVISION OF STANDARD PLANS FOR BUILDINGS.

The magnitude of the construction work of the Department being deemed such as to demand the services of a thoroughly competent and experienced architect, action toward securing such a man was taken, and in January, 1905, the services of Mr. F. B. Wheaton as advisory architect were secured through his transfer from the Office of the Supervising Architect of the Treasury. He was placed in charge of the force of architects and draftsmen employed with directions to effect all needed reorganization and to examine, and where necessary or advantageous, revise the standard drawings and specifications for all buildings, but more especially for barracks and quarters. Excellent progress has been made in this work, not only in the way of improving the general appearance of buildings, but through the elimination of unduly elaborate details of design and construction, better buildings at no increased cost from this source have been rendered possible, and the convenience of the interior arrangements greatly improved. The Department is not only improving the individual buildings, but through properly handling and placing them bettering the ensemble of the posts as well.

## BARRACKS AND QUARTERS, PHILIPPINE ISLANDS.

The progress during the year of authorized construction is reported to have been steady and to be at least 95 per cent completed. With few exceptions all troops are sheltered in posts constructed by the Quartermaster's Department, and upon completion of Fort William

McKinley there will be ample accomodation for all white troops in the division.

Following is a statement of purchases of lumber, hardware, roofing, paints, supplies for plumbing, water and sewer systems, etc., made in this country on account of construction in the Philippine Islands:

| | Barracks and quarters, Philippine Islands. | Army transportation. | Military post exchanges. | Regular supplies. | Incidental expenses. | Total. |
|---|---|---|---|---|---|---|
| New York | $34,332.16 | $34,803.09 | $1,644.45 | $5,006.62 | $1,037.30 | $76,823.62 |
| San Francisco | 5,562.11 | 45,217.09 | 182.40 | 16,273.81 | 82.43 | 67,317.84 |
| Philadelphia | 8,663.02 | | | | | 8,663.02 |
| Portland, Oreg | 24,716.00 | | | | | 24,716.00 |
| Seattle | 40,468.83 | | 2,820.37 | | | 43,289.20 |
| Chicago | | 503.57 | | | | 503.57 |
| Washington, D. C | | 8,700.00 | | | | 8,700.00 |
| Miscellaneous for advertising, printing, etc | | | | | | 190.93 |
| Total | 113,742.12 | 89,223.75 | 4,647.22 | 21,280.43 | 1,119.73 | 230,204.18 |

During the fiscal year 1905 material for continuing construction at Fort William McKinley, near Manila, P. I., was purchased or ordered purchased by quartermasters in the United States as follows: From the appropriation "Military post, Manila," $66,931.66; from "Military post exchanges," $1,641.62; total, $68,573.28. Cost of transportation and lighterage paid from appropriation "Military post, Manila," from establishment of post to July 19, 1905, has been $163,291.91.

Under date of August 25, 1905, it was reported to this office that it was expected all construction work at this post would be completed by October 1, when it would consist of 202 buildings, intended as provided by the law establishing the post to accommodate a brigade. A complete water system has been installed, the source of supply being three artesian wells. The storage tank connected with this system has a capacity of 100,000 gallons. Plumbing has been placed in such buildings as necessary, a sewer system completed, and a 15-ton refrigerating plant installed. Necessary wharves, etc., have been built and the roads macadamized. When ready for occupancy the post will be complete in every respect and one of the most comfortable ever provided by any country for troops in the Tropics.

With the completion of construction work in the Philippines will come considerable reductions in the expense of maintaining that division, especially in the matters of rents, purchases of material, hire of mechanics, laborers, teamsters, and such employees, and probably also reductions in the clerical force. Already, in compliance with telegraphic instructions from this office, considerable has been accomplished in this direction, the Division Chief Quartermaster having been advised that he would be required to keep within the decreased allotments for that division resulting from the reduced appripriations for the Department and apportioned as provided by the act of March 3, 1905, amending section 3679, Revised Statutes.

### LEGATION GUARD, PEKING.

Following allotments were made from funds of the fiscal year 1905, in connection with shelter of legation guard, Peking, China: From "Barracks and quarters" for construction and repair of buildings,

$7,382.08; from "Construction and repair of hospitals," for repair of hospital, $326.05; from "Shooting galleries and ranges," in connection with target practice, $200; from "Army transportation," for fire ladders, buckets, etc., $1,748.96; total, $9,657.09.

The company of infantry formerly stationed at Peking as a legation guard having been replaced by a company of marines, the post erected by this Department has been turned over to the Marine Corps. After much trouble and expense in clearing and inclosing the grounds with a wall and the expenditure upon buildings of $51,936.22, making a very compact and complete post, it is to be regretted that this has passed from the control of the Army.

### GENERAL IMPROVEMENTS.

*Care of buildings.*—It is recommended that steps be taken to prevent rough usage and enforce better care of buildings at posts, especially barracks, and also barrack furniture. During recent inspections by the Chief of Staff and the Quartermaster-General it was found that barracks at many posts were treated with remarkable lack of care, floors and walls being subjected to unnecessarily severe treatment and furniture to destructive usage. Especially was this lack of care noticed in the excessive use of water and concentrated lye in cleaning floors and woodwork, and in defacement of walls through knocking off plastering, etc. A little more care in the use of buildings would largely reduce the sum total required yearly for repairs.

*Steel wall lockers.*—A very material improvement has been made by the introduction of enameled steel wall lockers in barracks instead of the wooden wardrobe lockers heretofore used. The increased difficulty of obtaining suitable lumber for construction of the wardrobe lockers at a reasonable cost rendered it necessary to search for some other material, and the steel lockers are now being furnished at an average cost of less than that paid for the wooden lockers.

*Box lockers.*—Experiments have been made toward improving the present style of box lockers with the result that a pattern has been adopted for future use which to all intents and purposes is a steamer trunk with tray, and inside measurements the same as those of the wooden lockers, and which there is no doubt can be checked and carried as personal baggage. It is to be made of three thicknesses of light wood with grain crossed, forming a very strong material not liable to warp or crack, this covered with an exceedingly tough vulcanized fiber and studded with clinched nails, the outside painted a light drab color. It is provided with trunk handles and lock, spring fastenings, and is in fact a very neat trunk. Being made of a thinner material than the old locker, it is much lighter; at the same time it is so constructed as to be much stronger and stand more wear and tear. The Army will be supplied as soon as the stock of the old style is low enough to justify.

*Panniers.*—The same material and construction have been adopted for panniers for veterinary medicines, dressings, etc., thereby making a more sightly and convenient package and reducing its weight about 10 pounds.

*Field desks.*—A new model field desk, also of the same material and construction as the trunk locker, is being constructed for experimental purposes with a view to adoption in place of the present one. Such changes in the arrangement of the interior have been made as experience has determined to be advantageous and no doubt is entertained of its success. It will weigh little more than half as much as the old style, thus be more easily handled and transported, will be stronger, provided with improved lock and fastenings, and of better finish and appearance.

The cost of the above articles in the new material and improved models is about the same as in the old ones, while the important advantages of reduced weight, increased strength and durability, and greater convenience in every respect are gained.

*Screens, storm doors, and windows.*—Considerable progress has been made toward furnishing door and window screens for barracks, quarters, hospitals, and other buildings requiring them. Modern research having determined that the spread of several diseases is largely or wholly through the agency of flies or mosquitoes, this item becomes important from a sanitary point as well as because it conduces largely to the comfort of the occupants of buildings. So also at northern posts storm doors and windows have been supplied to render the buildings more comfortable and lessen consumption of fuel.

*Water, sewer, lighting, and heating systems.*—The older posts are generally well equipped and the newer ones being provided with these systems as rapidly as means at hand will allow. All necessary repairs have been made, and while it has not been practicable to meet in full all demands of the various posts throughout the country, the reasonable and absolute requirements have been met. During the year authority has been given for sinking wells at eight posts; for installing or improving water systems at 58; sewer systems at 40; for garbage cremators at 4; introducing or enlarging electric-lighting systems at 24, and installing or improving heating plants in buildings already built at 21.

In connection with lighting, it may be noted that nearly all the important permanent posts are now lighted by either electricity or gas, and others will be as fast as funds are available. These methods of lighting are well known to be superior to mineral oil, and, while the Department furnishes the best grade of kerosene and very superior lamps, carelessness in handling and keeping them clean, trimming and renewing the wicks is too common, and in many barracks is evidenced by smoky ceilings and a quite perceptible odor of the oil. With reasonable care this could be avoided, but that care is too seldom exercised.

With a view to uniformity, general specifications for fire-extinguishing apparatus and for plumbing buildings have been prepared. The results indicate that this is a very advantageous method, and a much better and more uniform class of fixtures are being now obtained.

With a few exceptions, the stations throughout the Philippines Division are supplied with water from running streams and wells, which is distilled for cooking and drinking purposes. Twenty-six distilling plants are reported in use and 12 on hand at the Manila depot available for supply. Progress is reported in installing and completing water-distributing and sewer systems at the posts designated for permanent occupation.

*Fire protection.*—Fire-extinguishing apparatus has been supplied to 14 posts. A new standard hand fire extinguisher for emergency protection has been adopted, which is an improvement over the old style, both as to efficacy and durability, being practically indestructible, and posts are being supplied with them. If cared for according to instructions and properly placed, they will always be ready for instant use, and from their immediate availability will often be the means of preventing serious losses by fire.

*Ice plants.*—There are ice machines at ten posts in the United States, one at San Juan, P. R., nineteen at posts in the Philippine Islands, with three reported as at the Manila depot being repaired for installation at two additional posts. Most of these machines are of 2,500 to 5,000 pounds daily capacity, except the one at Fort William McKinley, P. I., which is of 15 tons. In the Philippines they are, as a matter of economy, generally operated in connection with the water-distilling plants, and at all but one of the posts cold storage is established in connection with them, using the surplus refrigerating capacity of the plant to chill the storage room. Reports show that the net cost of ice manufactured and issued to troops in the Philippines has been 36 cents per 100 pounds.

The provision of the army appropriation bill approved March 2, 1905, permitting sales of surplus ice and electric light has proven satisfactory so far and should be continued. It is recommended that the word "hereafter" be substituted for the clause limiting the operation of this provision to the fiscal year to which the bill pertains, so that it will not be necessary to repeat it from year to year. It is understood this limitation was only to avoid the necessity for repeal of the clause in case results indicated it advisable to discontinue the practice.

## ALLOWANCE OF QUARTERS TO OFFICERS.

It has been for some years realized that a readjustment of the allowances for quarters and rates of commutation was needed, and it is becoming all the time more urgent. This matter I first brought up in a memorandum to the Secretary of War, October 7, 1903, which, with recommendation of the Chief of Staff and other officers by whom it was considered, was submitted to Congress with favorable recommendation and draft of proposed change in the law by Secretary Root, January 7, 1904, and printed in House Document No. 360, Fifty-eighth Congress, second session. The recommendation was renewed by the Acting Secretary of War, December 5, 1904 (H. Doc. 31, 58th Cong., 3d sess.), and I fully discussed the question in my annual report for 1904 (pp. 23 to 25) and hearing before the House Committee on Military Affairs, December 16, 1904 (pp. 156 to 158). If I could think of any way to so state conditions as to show more clearly the unfortunate and embarrassing position in which officers find themselves when ordered on duty to stations in cities where there are no public quarters and where they must rent dwellings for themselves than has already been done, I would gladly do so. Details on duties which require officers to accept commutation of quarters almost invariably require them to take stations in the larger cities of the denser populated sections of the country, where rents are very high and, so far as I can learn, always far above the commutation for the accommodations authorized for the different grades of officers for quarters appropriate to the rank of the officer.

The number of rooms is fixed by regulation according to rank and has been the same for more than a generation, having been fixed in the regulations of 1862, forty-three years ago, when the cost and manner of living were very much below the standard of the present day.

The commutation allowance of $12 per room was established by act of Congress approved June 17, 1878, previous to which time the rate seems to have been fixed by the Secretary of War. At the close of the civil war the rate was $18 per room, which allowance remained in force until the passage of the act referred to.

The prevailing rates of pay for officers of the Army were fixed by act of Congress approved July 15, 1870. There has therefore been no increase in pay for more than thirty-four years, while, as shown above, the rate of commutation of quarters has actually been reduced one-third during that period, and at the same time the cost of living, especially in the matter of rents, has enormously increased.

Necessarily a large number of officers are detailed to cities where public quarters may not be provided. While upon such detail an officer is actually subjected to a practical reduction in his pay, for the reason that his commutation is not sufficient to rent for him suitable quarters. As the salaries of army officers are not over sufficient under the very best condition, it can readily be seen why details to stations involving expenditures for quarters unavoidably in excess of commutation have come to be generally considered as hardships to be avoided rather than as duties to be cheerfully accepted and performed. It is believed that no officers now on service that requires them to hire quarters and draw commutation therefor as fixed by regulations are able to provide themselves with suitable ones for the amounts allowed.

As the price per room and the number of rooms allotted each officer are fixed by law, according to rank, it is not possible to prescribe regulations that will alter the same. The matter can be corrected only by legislation which may either increase the number of rooms hitherto allowed or the amount of commutation per room. I respectfully recommend that, rather than increase the commutation per room, the number of rooms allowed be increased as follows:

| Rank. | Present allotment. | | Proposed allotment. | | Increased cost. |
|---|---|---|---|---|---|
| | Rooms. | Cost. | Rooms. | Cost. | |
| Second lieutenant | 2 | $24.00 | 2 | $24.00 | .......... |
| First lieutenant | 2 | 24.00 | 3 | 36.00 | $12.00 |
| Captain | 3 | 36.00 | 4 | 48.00 | 12.00 |
| Major | 4 | 48.00 | 5 | 60.00 | 12.00 |
| Lieutenant-colonel | 4 | 48.00 | 6 | 72.00 | 24.00 |
| Colonel | 5 | 60.00 | 7 | 84.00 | 24.00 |
| Brigadier-general | 5 | 60.00 | 8 | 96.00 | 36.00 |
| Major-general | 6 | 72.00 | 10 | 120.00 | 48.00 |
| Lieutenant-General | 6 | 100.00 | 12 | 144.00 | 44.00 |

The allotment of quarters to officers in the proportion proposed will be in near relation to the present allowance of quarters at military posts and will enable officers serving in cities and at places where the Government does not own quarters to rent suitable quarters for something near the amount of commutation, removing the necessity of drawing upon private funds or curtailing the regular pay of the officer in order to make up the deficiency for rent.

Therefore, taking into consideration the conditions above described, the allowance recommended is deemed reasonable and the money allowance no more than sufficient to rent very modest quarters for officers of the Army serving in cities, and it is almost entirely such that are required to accept commutation.

## CLOTHING AND EQUIPAGE.

The sum appropriated by Congress for clothing and camp and garrison equipage for the fiscal year was $4,000,000. This was $750,000 less than had been appropriated for the preceding fiscal year, although the number of troops to be supplied was practically the same and the cost of supplies and materials was increasing. To the $4,000,000 appropriated was credited as "Reimbursement on account of issues of clothing and equipage supplied to the militia of the States and Territories" $627,640.87, and collections by Pay Department on account of clothing drawn by enlisted men in excess of their allowance, sales to officers, surveying expeditions, and other miscellaneous and duly authorized sales, $165,301.20; making a total of $4,792,942.07. Of this sum there was remitted to officers of the Department for the purchase and manufacture of clothing and equipage $3,605,187.98, and for settlements at the Treasury of claims and accounts $267.50, making a total of $3,605,455.48, leaving a balance of $1,187,486.59 in the Treasury on June 30, 1905, all of which will be required to pay the outstanding indebtedness incurred prior to the close of the fiscal year.

### ABSORPTION OF STOCK OF CLOTHING RENDERED OBSOLETE BY ADOPTION OF THE NEW UNIFORM.

The methods first adopted toward the introduction of the new olive-drab uniform are considered to have been mistaken. Its adoption was hastily promulgated July 17, 1902 (G. O. 81, A. G. O.), at a time when this Department had on hand a large stock of the old style blue uniform, supplied for use during the Spanish war and left on hand because of its early close and the muster out of the volunteers, the money value of which was approximately $3,000,000. It should have been clear that it would take several years to use up this quantity through issue to troops of the regular establishment, but notwithstanding this officers were permitted to equip themselves with the new uniform at their convenience, with a requirement that all should supply themselves with it before January 1, 1903. In the mean time, for the enlisted men, articles of the old uniform were to be issued until the available supply became exhausted, so that inevitably officers equipped themselves with the new uniform long before the enlisted men could be furnished it. As might have been foreseen, this developed ever increasing pressure to begin issues of the new uniform to meet the desires of officers, regardless of the serviceable stock of the old available. The success of commanding officers of some organizations in obtaining authority, for special reasons, as for the purpose of show at expositions, etc., to equip their men with the new uniform, and a too early effort to introduce it through issue to troops returning from the Philippines, further complicated matters and multiplied the perplexities confronting this office.

Every effort has been made by this Department to facilitate absorption of the large supply of good blue clothing rendered obsolete by adoption of the new uniform. Supply of the olive drab to organizations returning from the Philippines has been discontinued, as it was found adherence to this policy would equip the Army with it long before the blue could be issued, leaving much of the latter to be disposed of at public sale at great loss, although of excellent material and make. Notwithstanding a general desire on the part of officers to equip their commands with the olive drab service uniforms and overcoats, and on the part of the men to draw them, issue has been restricted to organizations supplied upon return from the Philippines before that mistaken project was abandoned.

As an inducement to the enlisted men to draw old style clothing, the issue prices of the following articles have been reduced: Overcoats, from $8.59 to $6.44 each; blouses, lined, made, from $3.90 to $2.93 each; blouses, unlined, made, from $2.65 to $1.99 each; cork helmets, white, from $1.25 to 25 cents each; cork helmets, khaki, from $1.85 to 40 cents each. This was done to encourage the men to draw liberally of these articles for wear at work or when off duty, thereby hastening disposal of them, and no corresponding decrease in the clothing allowance was made.

It is expected that the stock of the old blue uniform will be so far absorbed that issues of the new olive drab to all organizations can begin July 1 of next year. The new dress uniform, including coats, breast cords, and dress caps, is now being furnished to all troops, except the artillery arm of the service, to which issue of the old style dress coats is continued.

While there is no question as to the advantages of the olive-drab uniform for wear in active field service and no effort has been spared by this Department to perfect it in all details of design and manufacture, as well as to insure the very best of material being used in every particular item of its composition, I can not but consider that for a uniform in time of peace the blue is in every respect preferable. In viewing two bodies of troops on the march or on parade, one wearing the blue and one the olive drab, I am impressed that the blue clad men present a far neater, more imposing, and more soldiery appearance than their companions in olive drab. Then, as to the overcoats for officers, I think the discarded blue so superior in appearance, style, and in every way that there is no comparison. The olive drab is an excellent color for duty in the field, but for a uniform it does not and can not compare in appearance with the blue.

## CHANGES AND IMPROVEMENTS IN CLOTHING AND EQUIPAGE.

Much study has been given to improvements in all matters of clothing and equipage during the past year. Intelligent criticism of all such supplies has been invited and gratefully received, and suggestions along promising lines have been carefully investigated and, where found of value, utilized. Among other improvements, sizes of the garments have been revised and the Department now furnishes them in sizes conforming to those used commercially. So carefully have the patterns been worked out and sizes graded that it is now only in very rare instances that alterations need be made in clothing to secure a fit when proper care has been used in issues. Beyond doubt, when all the improvements now being worked out have been completed, as they will at an early date, our Army will be the best clothed body of men in the world. Of course, individual preferences have not in every respect been met, but it has been the general good that has been considered, not personal tastes and prejudices.

The complaints that have been made have usually, upon investigation, been found to arise from inattention to orders and instructions, careless issue, personal bias, or lack of information. In numerous instances they have referred to obsolete articles, which, while known to be not of the best, were too serviceable to be discarded, and to have done so would have incurred useless and unwarranted expense, thereby inviting adverse criticism from Congress.

From the Philippines Division comes again the complaint that the khaki uniform fades. It was explained in my last annual report that this was among the purchases made during the Spanish war and the time of hostilities in the Philippines, when the exigencies of the service were such that it was impossible to secure supplies strictly conforming to standards and specifications. The sudden large reduction in the military force left in the depots a large stock of clothing supplies, procured under stress of emergency, which economy requires should be absorbed by issues. This condition has been so often explained, and the cooperation of officers in disposing of the serviceable articles asked, that the continued complaining is a little surprising, especially when it comes from officers actively identified with the administration of military affairs at the time the supplies were purchased, and who should be presumed to have full knowledge of the conditions of purchase and the causes for the large stock now on hand.

This Department has carefully investigated the problem of providing a better grade of cotton khaki than the old and has secured a quality which, after being subjected to the most exacting tests, has shown highly satisfactory results. This cloth has been tested in comparison with two of the best procurable grades of English khaki, and was found to excel them in every respect and particularly as to fastness of color. As soon as issues of uniforms made from this grade replace those of the old stock it is expected the complaints will cease, with the removal of the grounds upon which to base them. But the old stock is too large and too serviceable to dispose of at the prices it would bring at auction. Some of the trouble complained of in the Philippines has arisen from retaining in storage there stocks in excess of the needs of the number of troops in that service, obtained when the force was much larger than it is now, considerable quantities of which should have been returned to the United States for storage before they became so injuriously affected by climatic conditions as to be useless for issue. In this connection attention is invited to the statement on a following page showing the large quantity of deteriorated khaki clothing returned to San Francisco and sold.

So also with reference to other articles of which criticism comes from the Philippines. The corrugated sweat band for campaign hats, for instance, was not a success and was abandoned some years ago. The present make of hat is of most excellent material and design throughout, and for shipment is packed in improved cardboard forms, insuring delivery in the best possible condition. When its use becomes general there is little doubt that it will give entire satisfaction, though possibly through lack of disposition to make proper investigation the old threadbare complaints will continue to be heard for some time to come.

The same remarks apply to the russet shoes and mosquito bars complained of. As soon as the old stock is absorbed the new classes will be issued, and they are in every particular, so far as experts can judge, the best that can be made. But while this is true the old is not so unserviceable as to justify its rejection or sale at a useless sacrifice.

The mosquito bars, for instance, are of a stock purchased in 1898, of the quality obtainable for use of the Army in the large quantities required at that time, left on hand by reduction of the Army and, while not up to our present standard, too good to dispose of at auction at large loss; in fact, to do so would be wasteful and reprehensible extravagance, and recommendations to this end show lack of proper consideration of the public interests.

*Dress coats.*—It having been reported to this office that some of the sizes of the new dress coat did not fit sufficiently well at the neck to preclude the desire to alter them, the patterns have been revised to meet all requirements.

*Olive-drab kersey.*—The olive-drab covert cloth now being used in the manufacture of overcoats and service breeches, being considered not entirely adapted to the service for which intended, experiments have been and are now being conducted with a view of substituting a kersey of the same shade weighing 22 ounces per yard. Samples are being made which, should they prove satisfactory, will be submitted for final action.

War Department General Orders, No. 197, series of 1904, prescribes a woolen service uniform for wear in the United States proper, including Alaska, to be furnished in heavy weight for winter and light weight for summer. Preliminary steps to carry the provisions of said order into effect have been taken, and the Department is engaged in perfecting a material of suitable light weight in addition to the heavy material already provided. It is expected the matter will be brought to a satisfactory conclusion at an early date.

*Shoes.*—A full supply of the new model marching shoes has been procured, and they will be issued to the entire Army at once, when it is decided to begin issuing them, which it is expected will be about July 1 next, when the general introduction of the new uniform is contemplated.

Full descriptions of this new russet marching shoe, the dress shoe, and the garrison shoe were given in my last annual report, but in addition it should be said that the new marching shoe is furnished with either single or double sole, leather or canvas lining, thus providing footwear adapted to all climates and different conditions of service.

A limited supply of shoes of what is known as the "orthopedic" pattern has been purchased, and they are now being tested through actual wear by officers and enlisted men. Reports are very favorable, and this style will be furnished for issue, increasing still further the latitude for selection to meet conditions of service.

The Department is now ready to furnish the Army with the best shoes ever issued to troops, and is restrained from doing so immediately only by the large number of the old pattern, purchased during the Spanish war, on hand.

It had not in the past been the practice of this Department to furnish half sizes in shoes, but in the new styles this is being done, so that with the exercise of proper supervision on the part of issuing officers there is no reason why men should not be properly fitted. The Department now furnishes shoes of all commercial sizes and widths normally required for troops, of excellent material and make, and in styles appropriate for every kind of duty and each phase of a soldier's life. The very few complaints as to shoes that have recently been heard are, upon investigation, found to relate to the old patterns, which never were entirely satisfactory. It is believed that with the introduction of the new styles of shoes to general use it will be found that the perplexing problem of suitable footwear for the Army has been solved.

*Barrack shoes.*—The old make of barrack shoe has been replaced by one of the "orthopedic" pattern, made of 15-ounce white cotton duck, with russet-colored calfskin tip and the top of the vamp covered with the same material and lined with sheepskin in order to give additional strength where eyelets are inserted. First quality in material and make is provided and an altogether superior shoe for the purpose designed is supplied, the improved appearance and comfort of which will be appreciated.

*Gymnasium shoes.*—Heretofore no other than the regulation army shoes were furnished by this Department to the enlisted men of the Army for wear while engaged in athletic exercises. The need of a more suitable footwear for this purpose being apparent, it was decided to adopt a black gymnasium shoe, which is being furnished at contract price and undoubtedly will be appreciated.

*Leggings.*—It having been determined from trials of the new marching shoes that leggings of the established pattern are faulty for wear in connection therewith, test is proposed of a pattern very similar to the one which was unsuccessfully tried two years ago, but with such modifications as it is believed overcome the objections then developed, and furnish the improvements in this article of a soldier's clothing for which the Chief of Staff has been seeking, and the desirability of which was first brought to my attention by him.

With the idea of permitting freer action of the ankle and foot, the gaiter has been omitted in favor of a close fit around the ankle at the instep, made possible because of the height of the new style marching shoe. The strap, which was found to interfere with the natural movement of walking, and on wet ground to collect and hold mud, has been omitted, and to keep the legging from slipping up a leather or linen string is fastened to the inside of the back and tied through the strap of the shoe. This pattern is made to lace in front instead of the side. They are made, for infantry, in five sizes, one lot of 250 running from 10½ to 11½ inches in length, and another lot of 250 running from 11½ to 12½ inches in length. The top will be high enough to protect the leg but leave free play for the muscles in walking, and the shortening and omission of the gaiter will also somewhat reduce the weight. Should the tests prove this style a success, it will be adopted for future use by infantry in such group of sizes as shall be determined by the results of the experiment.

Two hundred and fifty pairs of the same style, in five sizes, from 13½ to 14½ inches in length for test by cavalry have also been ordered. It is believed the front lace will be found an acceptable improvement for this service, obviating the tendency in the present style for the hooks of one man's legging to catch on those of another and tear out when riding close. While, with the idea of improvement, the patterns above described will have thorough trial it should be understood that the present make of legging is an excellent article, made in five sizes to fit ordinarily well-shaped men, and if proper care is used by issuing officers to see that the men are fitted at the time of issue no trouble on this point will be experienced.

*Berlin gloves.*—A new white glove has been adopted to replace the berlin glove heretofore furnished. It is of a much better pattern and quality, presents a neater appearance, and will unquestionably prove very acceptable to the Army. Experiments are now being conducted to perfect a change of pattern of the gloves at the wrists so as to make them fit more snugly and do away with the rubber band ordinarily used, which soon deteriorates. It is thought a gore at each side of the wrist will give a proper fit. Experiments are also being made with the intention of securing these gloves in khaki and olive-drab colors.

*Tan-leather gloves.*—There were purchased during the last fiscal year, at a cost of $1.10 per pair, 250 pairs of mocha and cape gloves of a tan color, for sale to and trial by officers and enlisted men of the Army. They were distributed in small quantities to the several military departments for that purpose, and reports received indicate that they have met with such favor that further purchases will be made. It is believed that the present buckskin glove, issued to the infantry arm of the service for wear as prescribed by War Department General Orders, 197, of 1904, will eventually prove unsuitable on account of the difficulty of properly handling the gun while wearing it. Its use by infantry was not recommended by this office, which was from the first of the opinion that it was too thick and cumbersome for wear in handling the arms of that service. The gauntlet for the cavalry arm, which was discontinued in establishing the new uniform, has nevertheless been retained for a portion of the purchases, and is issued when desired because of its advantages and the preference of a majority of cavalry officers for that style.

*The new campaign hat.*—This hat has proved a vast improvement in all respects over the old style and has given satisfaction. It is in every way of better appearance, better quality, and better make than the old one, and of course costs more.

*Olive-drab cap.*—A standard pattern has been adopted, made on the same lines as the present dress cap; that for enlisted men being plain, and for officers having a band of lustrous braid of a darker shade than the crown. These will be furnished when the general use of the new uniform begins.

*Metallic ornaments.*—New standard samples of all metallic ornaments, gilt and bronze, prescribed for officers and enlisted men, strictly conforming to the provisions of War Department General Orders, No. 197, series of 1904, have been procured and adopted. The crossed cannon, crossed rifles, and crossed sabers have been greatly improved upon, the designs being strictly in conformity with the arms used by the respective organizations. The size of the collar ornaments for the enlisted men has been reduced in keeping with the height of the collar, and all of these now present a neater and much more artistic appearance.

*Metallic coat buttons.*—The bronze coat buttons conforming to former standards were believed not to be sufficiently strong to withstand the roughest service and have been replaced by buttons strengthened by reenforcing the outside shell with an inner one of aluminum fitting snugly and forming a firm support.

*Sweaters.*—With the idea that much comfort would follow the issue of sweaters to the enlisted men, suitable samples of an olive-drab color have been procured and adopted as standards, and the Army is now being supplied with them. The issue, however, will not involve an increase in the clothing-money allowance.

*Stockings.*—The brown-mixed cotton stockings, both of light and heavy quality, adopted many years ago, have been discarded. To avoid loss through deterioration and secure needed storage room, the sale of those on hand since the Spanish war was determined upon. Experiments were made in dyeing them a solid brown, but the cost involved and the indifferent results obtained demonstrated the inadvisability of going further into the matter. The introduction of brown or tan colored cotton stockings of excellent quality in two weights has been decided upon, and they will give satisfaction to the Army.

The specifications for the woolen stockings have been changed to require the introduction into their make of a sufficient proportion of cotton to prevent shrinkage, which will be found an advantage.

*Barrack bags.*—Heretofore barrack bags have been made of brown canvas, of a pattern and shade adopted twenty years ago when their use was first introduced. The brown color was probably chosen as showing the least effects of soiling, and while no complaints as to these bags have been received, it has been determined to hereafter furnish them in white canvas, which will present a neater appearance, and, as they must in any event be washed, tend toward cleanliness, because the soiling will be apparent.

*Suspenders.*—The suspenders heretofore supplied were of a very old pattern, cheap and unsuitable; therefore two standard patterns of the best modern make have been adopted and will be furnished with webbing of olive-drab color. Those on hand at the beginning of the fiscal year were purchased during the Spanish war, and, having deteriorated from age, were sold by authority of the Secretary of War.

*Olive-drab blankets.*—After various experiments and careful study a new standard blanket of heavy weight, conforming in color to the olive-drab uniform, has been adopted. The border is brown, and the letters "U. S.," 4 inches in height, in the center of the blankets, conform thereto in color.

Standard samples of olive-drab blankets of light weight were also manufactured, but not proving satisfactory in all respects the Department is now engaged in procuring others.

*Iron bedsteads.*—The Army is now being supplied with bedsteads of the pattern described in my annual report for 1904. The change, there fully described, was made because so many different models were in use that when it became necessary to replace or repair the wire bottoms the different fittings used by various manufacturers caused much difficulty and useless delays and expense, all of which has been eliminated by the adoption of a single standard. Troops in barracks will generally be provided with single bedsteads, while for guardhouse purposes and where sleeping accommodations of barracks are limited, a double bedstead (one bed above the other) will be furnished. They will be supplied as fast as those at posts become unserviceable. In order that no difficulties may be experienced in assembling the beds when received at posts, each purchasing depot has been furnished with a set of devices for use in the inspection of the bedsteads and instructions have been given which if carried out will insure a perfect fit of the head and foot pieces to the bottoms.

*Tentage.*—The drab canvas tents, of which complaint of fading has been made, are of a supply provided during the Spanish war. Most of them have been used in the field to some extent, afterward stored and issued as required, and while serviceable are not of the standard of to-day. Progress had been made toward securing a khaki-colored canvas for tents, but it having developed that there was no competition in the supply of that material, which was evidently a monopoly, it was determined to discontinue all attempts along this line and retain the present standard, which is an excellent material and in many respects more suitable than the colored. The tin collars for stovepipes are to be replaced by asbestos ones, as being safer and less likely to damage the canvas when packed for transportation. The shelter tents now being issued are of the 1898 pattern, no change having been made since its adoption.

Recent developments also indicate that little or no competition can be expected in response to future calls for khaki and white cotton uniform cloth, and it is very probable the Department will have to investigate this matter and recommend such action as will prevent the Government from being placed entirely at the mercy of one concern or a combination for a supply of these materials.

*Barrack chairs.*—New specifications for barrack chairs were adopted December 13, 1903, which provided for a well made, thoroughly braced chair of the best of materials, a decided improvement on the pattern which it superseded, and the issue of which was discontinued. This chair is far superior to the kind commonly used in offices, public halls, etc., and with reasonable care should last indefinitely, though of course it will give way before the careless and inexcusably rough usage to which such furniture is too often allowed to be subjected by enlisted men in barracks. Still further improvement has been made in the joining of the two parts of the seat, but, being patented, can not be used until satisfactory arrangements can be made with the patentee, negotiations with whom are pending.

*Generally.*—All the above improvements, and the many others which it is not possible for want of space to specifically note, have been made with the object of furnishing the best and most suitable supplies obtainable. Of course this costs more than would inferior grades, but on the other hand it is economy because of the better service and longer wear obtained, to say nothing of appearance and the greater comfort resulting to the troops, which naturally increases their efficiency.

### SALES OF SURPLUS AND OBSOLETE CLOTHING.

At the beginning of the fiscal year there remained on hand large quantities of clothing and equipage, supplies purchased in consequence of the Spanish war when the Department was required to provide supplies for 360,000 troops. These supplies being liable to deteriorate and become of little value if much longer held, authority of the Secretary of War was requested and given to sell such quantities of them as could be done to advantage and to reduce the prices of those issued to troops.

In consequence the following have been sold or soon will be: 90,000 pairs suspenders; 164,138 pairs heavy cotton stockings; 1,402,516 pairs light cotton stockings; 68,825 pairs black calfskin shoes; 163,321 pairs russet shoes. The stockings and shoes thus far sold have brought satisfactory prices, and the suspenders as good as could be expected, considering their impaired condition.

There were also sold at the San Francisco depot 122,666 khaki coats and 109,161 pairs of khaki trousers, returned from the Philippines so much damaged through climatic conditions as to be unfit for issue, for which advantageous prices were received. The amounts realized from sales of property of this class, less the expenses connected therewith, must by law be covered into the Treasury to the credit of miscellaneous receipts and are not available for use of the Department.

### MERIT AND CAMPAIGN BADGES.

It having been determined that the President has authority to prescribe badges as a part of the uniform of the Army, War Department General Orders, No. 4, of 1905, was issued so establishing them, providing for sales to officers and issues to enlisted men of badges and service ribbons to distinguish service in certain campaigns, the manner of wearing them, and that they be supplied by the Quartermaster's Department.

This order provided for a badge to holders of certificates of merit, and War Department General Orders, No. 5, of 1905, established badges to commemorate service in campaigns as follows:

> Spanish campaign badge: To be issued to officers and enlisted men who served ashore in the island of Cuba between May 11, 1898, and July 17, 1898; in the island of Porto Rico between July 24, 1898, and August 13, 1898, or in the Philippine Islands between June 30, 1898, and August 16, 1898.
>
> Philippine campaign badge: To be issued to officers and enlisted men who served ashore in the Philippine Islands between February 4, 1899, and July 4, 1902, or in the Department of Mindanao between February 4, 1899, and July 15, 1903.
>
> China campaign badge: To be issued to officers and enlisted men who served ashore in China with the Peking relief expedition between June 20, 1900, and May 27, 1901.

The manner of wearing service ribbons first promulgated was slightly modified by War Department General Orders, No. 123, of 1905.

This office was furnished with the various reports and papers discussing and considering the plan, among which were rough designs for the contemplated badges, approved by the Chief of Staff and Secretary of War. Following the general ideas of the reports and designs, specifications were prepared and proposals invited for furnishing a supply of each of these badges with ribbons complete and a suitable cardboard case for each one; also a supply of service ribbons.

Owing to the many details connected with perfecting the designs and engraving and completing the dies, and because the work thus far accomplished in this direction has not possessed the artistic merit which should characterize these badges, but little material progress has been made.

This is a case wherein much better results could have been had were the Department not limited by the provision of the law requiring purchases to be made by calling for bids. From the nature of these badges it was desirable that the matters of quality of metal used in their manufacture, artistic treatment of the design, and beauty and durability of finish receive greater consideration than the price to be paid. It was necessary, however, in compliance with law and regulations, to call for bids, and when opened these disclosed the fact that the lowest bidder had submitted an offer so much below the estimates of this office and the offers of competitors that it seemed probable the artistic requirements, quality of the alloy, and the finish of the badges must be slighted to leave a margin of profit. Although a representative of the lowest bidder was informed that only the best quality of alloy, satisfactory treatment of the design, and the best work generally would be acceptable, he insisted that all this had been considered. Developments since, however, indicate that either this had not been done or that the ideas of the bidders and this Department as to excellence varied extremely. It would have been much better, in this instance, could this office have had authority to select a manufacturer concerning the quality and merit of whose work there could be no question and have ordered the badges made. As, however, the lowest bidder had complied with all legal requirements, was a responsible concern, and professed to be able to meet the demands, award thereto was the only course open, although results, as was expected, have thus far not been satisfactory.

Many inquiries have been received from discharged soldiers and former members of volunteer organizations participating in the Spanish and Philippine campaigns asking whether they were entitled to the badges. Reply has been made in all cases that there is no authority to furnish them either by issue or sale to persons not in the military service and entitled to them as a part of the uniform. It has been decided that persons having service as prescribed in the order establishing these badges and serving in the organized militia can be furnished them under authority of section 1661, Revised Statutes, and acts amendatory thereto, upon requisition of the proper State authorities, to be charged against the State's allotment of the militia appropriation. This, however, was not originally intended and not contemplated in the estimate made of the quantity required, and to do so will require a large increase in the number to be manufactured.

It seems a little strange that in providing campaign badges no thought appears to have been given to service in the civil war—the greatest in which the country was ever engaged. A respectable number of officers and possibly also some enlisted men who would be entitled to wear such a badge yet remain in the service, and there are many retired officers who would be entitled to it. There are, too, Indian wars in which it would seem service fully as deserving a badge was had as in those selected, even if the numbers engaged were not so large, and many officers and men with such service are still in the Army. I believe it fitting that service in the wars overlooked should also be distinguished by a badge of suitable design, and recommend that one each be provided appropriate for the civil war and the Indian wars. In this connection, too, attention is invited to the purpose of the late President McKinley, as evidenced by a telegram published in General Orders, No. 39, Headquarters Department of the Pacific and Eighth Army Corps, Manila, P. I.,-July 2, 1899, that a medal should be provided for members of certain volunteer organizations for services rendered in the Philippines after the terms of their enlistments had expired.

## CLOTHING MONEY ALLOWANCE.

The advisability of providing a larger allowance for clothing upon the first enlistment of a recruit than is immediately available under present regulations has frequently come up and received consideration, and the Paymaster-General in his current annual report makes some valuable remarks upon the subject. It is believed, however, the method he advances is unnecessarily cumbersome, and the object might be more easily attained by having clothing accounts settled as they now are, except that if a recruit be found to be indebted to the United States on his first settlement the amount be carried over as due, and if at the next settlement he is still indebted that amount be charged against his pay and collected by the Pay Department.

The present allowance of clothing is liberal, and it is the exception and not the rule that a man, if he takes care of his clothing and the company commander scrutinizes clothing schedules, finds himself in debt at the end of six months. The company commander is often as much to blame as the man when it is found necessary to collect on pay rolls indebtedness for clothing. Some men are harder on clothes than others, and this is the only legitimate reason for a recruit to go beyond his allowance, which he should never be allowed to exceed afterwards. Overdrawn accounts should be settled at the end of the first year of enlistment, and thereafter company commanders should seldom allow accounts to be overdrawn except in case of loss by fire, or through other causes over which a man could have no control.

Authority to expend collar ornaments, or anything whatever of clothing, is not recommended. Experience proves such practice leads to extravagance and carelessness on the part of enlisted men and laxness on the part of some officers. The cost to this Department for collar ornaments, letters, etc., has for the past three years averaged about $76,500 per year, and there is little doubt that to allow them to be expended would cause a marked increase in the quantity required for issue.

### CAVALRY AND ARTILLERY HORSES AND MEANS OF TRANSPORTATION.

The following statement shows the number and cost of public animals, wagons, and harness purchased by this Department from July 1, 1904, to June 30, 1905:

| | Number. | Total cost. | Average cost each. |
|---|---|---|---|
| Cavalry horses | 1,211 | $158,719.85 | $131.07 |
| Artillery horses | 378 | 57,539.00 | 152.22 |
| Draft horses | 148 | 26,103.10 | 176.37 |
| Riding horses | 51 | 7,510.00 | 147.25 |
| Draft mules | 1,226 | 194,562.30 | 158.70 |
| Pack mules | 198 | 22,988.00 | 116.10 |
| Dogs | 44 | 2,025.90 | 43.77 |
| Spring wagons, Dougherty | 15 | 3,135.00 | 209.00 |
| Wagonettes, etc | 72 | 27,258.60 | 378.59 |
| Trucks, 2 and 4 horse | 10 | 3,178.20 | 317.82 |
| Trucks, 1-horse | 2 | 530.00 | 265.00 |
| Dump carts | 3 | 132.00 | 44.00 |
| Sanitary carts | 24 | 4,858.00 | 202.42 |
| Wagons: | | | |
| Express | 4 | 704.85 | 176.21 |
| Water, sprinkling | 8 | 1,919.80 | 239.97 |
| Spring, delivery | 14 | 1,455.50 | 103.96 |
| Miscellaneous | 12 | 2,915.25 | 242.93 |
| Sleighs | 31 | 898.70 | 28.99 |
| Sleds | 5 | 270.00 | 54.00 |
| Carts, hand | 586 | 9,707.64 | 16.57 |
| Bicycles | 4 | 155.75 | 38.94 |
| Harness: | | | |
| Single sets | 1,069 | 27,802.98 | 26.01 |
| Double sets | 1 | 90.00 | 90.00 |
| Cart | 78 | 2,370 00 | 30.38 |
| Dog | 7 | 37.50 | 5.35 |
| Total | ........ | 556,867.92 | ........ |

Comparison with prices paid last year shows a slight reduction in cost of animals purchased.

Of the above animals, 300 cavalry horses, 600 mares for use of the cavalry, and 17 artillery horses were purchased for shipment to the Philippines. The mares were purchased and supplied for use of the cavalry in the islands by authority of the Secretary of War with the idea that when they become unserviceable for army use and are condemned and sold they can be used for breeding purposes, thus aiding in improving native stock.

Recognizing the desire of officers of the cavalry and artillery to purchase the horses for their own organizations, boards have been constituted to conduct the buying for either, composed of officers of that arm of the service which was being supplied. This has been found a very safe and satisfactory plan and one which it is believed should be continued. Officers of each arm very naturally are better qualified to judge of the suitability of horses offered for its service and the combined knowledge and experience of several interested officers secures better selection, in this, as in business generally, than can be expected from the single judgment of one. At all events this method is more satisfactory to the officers and if a mistake is made in the selection of a horse the best possible use is made of him instead of the least as is sometimes the tendency.

### PACK TRAINS.

Transportation by pack train often becomes of vital importance in military operations, and realizing this the Department maintains, aside from the regular pack outfits of organizations, four fully equipped, general trains stationed at convenient western posts ready for immediate service whenever required.

The Department is now making an exhaustive test of the new Pullman pack outfit, which has many important advantages over the old. This is a patented article, but the Department holds a certificate from the patentee that no royalty will be charged upon any manufactured by the Department in any of its depots or under contract for its use.

### CONDEMNED ANIMALS SOLD.

| Kind. | Number. | Amount received. | Average price. |
|---|---|---|---|
| Cavalry horses | 681 | $29,710.52 | $43.62 |
| Artillery horses | 176 | 9,353.36 | 53.14 |
| Draft horses | 203 | 9,569.04 | 47.14 |
| Mules | 246 | 12,307.29 | 50.03 |
| Total | 1,306 | 60,940.21 | .......... |

During the year there were 973 horses and 357 mules lost, destroyed, died, etc. Of these 674 horses and 264 mules were destroyed, died, etc., in the Philippines. There remained on hand at the close of the fiscal year 1905, 17,920 horses and 7,938 mules, including 4,615 horses and 2,110 mules in the Philippines.

### PURCHASE OF HORSES AT POSTS.

Negative results have so far been obtained from attempts to buy horses under the provision inserted in the last army appropriation bill authorizing them to be purchased at posts where needed, at a maximum price to be fixed by the Secretary of War. Possibly after it has been longer in force and becomes more generally known better results may be reported, but as it now stands there has been developed only additional expense for advertising in calling, first for open-market supply and, later, for contracts, and delay in securing the horses required. It is understood this provision was intended by Congress to give local horse raisers in the vicinity of posts opportunity to sell their horses direct to the Government and that it was intended to apply to draft horses and mules as well as cavalry and artillery horses. If so, a similar provision should also be inserted under the appropriation for "Transportation of the Army." It now appears only under the heading "Horses for cavalry, artillery, and engineers," and if it ever came before him for a decision the Comptroller of the Treasury would doubtless hold that it did not apply to "Army transportation" from which draft animals are purchased.

## FORAGE.

Following is a statement of the forage and straw purchased during the fiscal year:

| Purchased— | Kind. | Pounds. | Cost. |
|---|---|---|---|
| In the United States | Oats | 77,051,599 | $1,087,004.90 |
| Do | Bran | 4,498,094 | 47,943.68 |
| Do | Corn | 4,147,091 | 49,287.69 |
| Do | Barley | 2,795,502 | 41,149.20 |
| Do | Middlings | 70,000 | 864.50 |
| Do | Dog feed [a] | 160,871 | 13,607.56 |
| Do | Hay | 111,146,279 | 751,909.43 |
| Do | Straw | 18,395,390 | 91,621.04 |
| In the Philippines | Native green forage | 15,230,634 | [b] 61,430.08 |
| In Porto Rico | do | 3,650,000 | 5,475.00 |
| Total cost |  |  | 2,150,293.08 |

[a] For Alaska.

[b] In this amount is included $10,151.41 paid in excess of contract price and charged against a defaulting Manila contractor and his bondsmen, which when recovered will be turned into the Treasury, leaving the net cost of forage purchased $2,140,141.67.

Of the above purchases, shipments to the Philippines were made as follows: Hay, 21,012,944 pounds, costing $172,944.45; oats, 19,725,896 pounds, costing $281,255.50; bran, 12,000 pounds, costing $128.40. Total cost, $454,328.35.

## FUEL.

Following is a statement of fuel purchased during the fiscal year other than for transports, harbor boats, torpedo planters, and cable ships reported elsewhere in connection with the operation of such vessels:

| Purchased— | Kind. | Quantity. | Cost. |
|---|---|---|---|
| In the United States | Anthracite coal ... pounds | 183,356,487 | $544,824.34 |
| Do | Bituminous coal ... do | 254,356,487 | 631,712.76 |
| Do | Wood ... cords | 46,819 | 259,215.07 |
| Do | Charcoal ... bushels | 5,109 | 1,664.19 |
| Do | Crude petroleum ... gallons | 657,532 | 12,609.14 |
| In the Philippines | Wood ... cords | 22,749 | 69,605.05 |
| Total cost |  |  | 1,519,630.55 |

### FUEL FOR OFFICERS' QUARTERS AND BARRACKS.

Experiences during the past year have only emphasized the necessity for the increased allowances recommended in my last annual report, and the recommendation then made that the law be so amended that the allowances for fuel for officers' quarters at posts situated between the thirty-sixth and fortieth degrees of latitude be increased by one-half from September 1 to April 30; that north of the fortieth degree from September 1 to April 30 the present allowance be doubled; and that in all latitudes, from May 1 to August 31, the allowance be doubled to meet the present conditions in the United States is hereby renewed and favorable action by Congress urgently requested.

Under the existing law fuel is sold by the Quartermaster's Department to the officers of the Army in fixed quantities, according to the rank of the officer, at the rate of $3 per cord for standard oak wood or the equivalent thereof in other kinds of fuel, as determined by this Office, and for any additional quantity they are required to pay the contract price.

By reason of the increased sizes of quarters now being used the fuel allowance of officers, which was fixed upon when quarters were smaller and the requirements were not so great, is inadequate.

The same condition existed in the new and large barracks, and it has been found necessary to authorize extra issues of fuel in order to heat those situated in the more northern latitudes, which has increased to a very noticeable degree the expenditures from regular supplies appropriation.

Officers in tropical climates have very little expense for fuel, while those at northern posts in the United States incur heavy bills, and many complaints have been received from them to the effect that their fuel bills were burdensome because of absolutely necessary purchases over and above the regulation allowances, to comfortably heat their quarters.

### SALE OF FUEL AND FORAGE TO RETIRED OFFICERS.

It is recommended that Congress be requested to authorize sales of fuel and forage to retired officers at contract price, otherwise subject to the same regulations as now apply to officers on the active list, when they reside at such points that it can conveniently be done and deliveries made without expense. This would in many instances be a great accommodation to the officer and impose no call for increase of appropriations.

### HEAVY FURNITURE FOR OFFICERS' QUARTERS.

At the risk of being thought unduly insistent, I desire to renew my recommendation of last year that Congress be requested to authorize the purchase of heavy furniture for officers' quarters. It would seem that the advantages of doing this would be patent to any man who has had to move and transport his household effects any considerable distance, and most men of affairs have. Aside from the cost of packing and handling, no matter how carefully prepared for shipment, it almost always happens that a large portion of the heavy and bulky articles of household furniture, when shipped, arrive at destination in a more or less damaged condition. It can readily be seen that the frequent and long moves officers of the Army are required to make under orders subject them to burdensome losses on account of such damages. The deterioration of household effects through moving is so great that it has given birth to the proverb "two removals are equal to one fire." Upon this basis officers of the Army during a natural term of service pass through many fires in a way that they can not guard against by insurance.

While the original outlay will entail some expense to the Government, the saving in the cost of transportation of such furniture which is now paid through this Department on an officer's change of station, as well as in the cost of packing and crating such articles, will render it an economical move in the end. It is believed to be so regarded by Departments which have authority to supply articles of this nature for use in quarters, and I consider it as more in the interest of the Government than of the officers that this authority be extended to the Army.

Furniture of the class it is proposed to supply, and which each officer now has as his private property, is, as a rule, not well adapted to use in the Philippines; hence officers ordered to stations there must either dispose of such property at a sacrifice or secure storage for it. If it must be sold it is always at a large sacrifice, which at their present rates of pay officers, especially the younger ones, can ill afford, and which it is a real hardship to compel them to make.

### MISCELLANEOUS SUPPLIES.

The following statement shows the number and cost of miscellaneous supplies purchased by this Department from July 1, 1904, to June 30, 1905:

| | Number. | Total cost. | Average cost each. |
|---|---|---|---|
| Middleby ovens | 28 | $9,039.00 | $322.83 |
| Portable bake ovens | 26 | 86.70 | 3.34 |
| Field ranges, hospital | 250 | 8,290.00 | 33.16 |
| Field ranges | 315 | 10,875.00 | 34.50 |
| Laundry outfits | 107 | 2,645.00 | 24.71 |
| Army ranges | 1,225 | 60,761.62 | 49.60 |
| Field desks | 544 | 4,183.12 | 8.85 |
| Street lamps | 744 | 2,136.90 | 2.87 |
| Lamps, pendant and bracket | 1,897 | 10,199.12 | 5.38 |
| Lanterns | 3,722 | 1,802.15 | .48 |
| Kitchen utensils | | 1,926.17 | |
| Tableware | | 25,992.61 | |
| Paulins, large | 400 | 10,448.00 | 26.12 |
| Paulins, wagon | 237 | 2,578.70 | 10.75 |
| Typewriters | 68 | 5,707.16 | 83.93 |
| Total cost | | 156,671.25 | |

Many warm commendations of the excellence of the supplies furnished have been received and the very few complaints brought to notice have almost invariably been found to be based on misuse of the article or disregard of instructions for its handling.

### EXCHANGE OF OLD TYPEWRITING MACHINES.

Authority of law to turn old typewriting machines in to the manufacturer at an agreed price in part payment for new ones would be advantageous to this Department. After a certain period in the life of a typewriting machine repairs become no longer economical, and it is the general practice in commercial life to make an exchange for a new one, the company taking the old machine at an agreed valuation and the purchaser paying the difference in cash.

Under the law and regulations governing the disposition of public property, unserviceable typewriting machines used by the Army must be submitted to the action of an inspector, condemned, and sold at public auction to the highest bidder, but the prices received at such sales are little more than sufficient to pay the expense thereof, whereas a reasonable figure will be allowed if taken by the manufacturers who can utilize all the old parts, while the ordinary purchaser simply buys for personal use or as a speculation a machine too worn to be longer valuable for office work.

An exception to the general rule in the case of typewriting machines would be advantageous, inasmuch as they are, so to speak, in a class by themselves, no competition being possible for a particular make of machine. Certainly the results to be obtained would be very satisfactory to the Government, and the several manufacturers have time and again expressed themselves as in favor of the idea by offering to accept them in exchange. It is understood that the desired end is secured in some departments by calling the exchange a "remodeling," but this is an evasion that would be discountenanced by this Department, which prefers that the law be so changed that action can be taken in perfect accord therewith.

## BATAN ISLANDS, P. I., COAL PROSPECT.

During Spanish occupation of the Philippines coal deposits were discovered in several locations, including the island of Batan, lying off the southeast coast of Luzon at the entrance to the Gulf of Albay. Concessions for working the mines had been granted and some work done toward developing them, without, however, fully determining the extent of the deposits or quality of the product.

Practically all the coal used by the army in the Philippines comes from Australia or Japan, and the expense of delivery in Manila brings the price to a figure which, from the great quantity required, causes a heavy draft on appropriations of this Department. Owing to the possibilities of interruption of the supply through marine hazard or the disturbed condition of affairs in the Orient, it is also necessary to carry in stock a large reserve supply, with the attendant risk of loss through spontaneous combustion, to which most of these coals are unusually subject, and deterioration from exposure to the weather through lack of storage facilities. Realizing the economy and desirability of securing a certain supply nearer at hand, if possible, investigation of the possibility of obtaining from some of the prospects in the island coal of a proper quality in sufficient quantities to meet the demands of the service was begun. During the latter part of 1901 tests were made by the chief quartermaster of the division of samples sent to him at Manila and investigations set on foot as to location of the sources of supply, extent of the deposits, and practicability of their being developed so that reliance could be placed upon their product.

Later the deposit on Batan Island was fixed upon as most promising of results. The western half of the island has been set aside as a military reservation and an option which will expire March 6, 1906, secured for the purchase at an agreed valuation of $50,000 of the concessions already granted.. Authority of the Secretary of War was obtained for expenditure of funds in prospecting the deposits and the work of trying to determine the extent and value begun. There has been expended for this purpose about $50,000.

Reports received are to the effect that the early investigations in 1903 exposed features which, taken in connection with the unknown geology of the Coal Measures of the Philippines, led to the abandonment of mine work and taking up an investigation by means of drills. Twenty drill holes are reported to have been sunk on the concession, using diamond drills which gave cores of the strata passed through. Some six seams were developed over 2 and under 4 feet in thickness, and two seams 6 feet in thickness, besides numerous seams from 12 to 20 inches in thickness. These seams all vary in thickness, one of the 2-foot seams showing in one drill hole a thickness of 10 feet, one of the 6-foot seams a thickness of 13 feet, and the other a thickness of 3 feet. The analysis from all these seams show component parts running about as follows: Carbon, 43 to 54; volatile, 36 to 45; water, 4.53 to 6; ash, 1.28 to 10; sulphur, less than 1 per cent—generally one-half of 1 per cent; specific gravity, 1.50. Reports are that the ash is very light in color and clean, no clinkers found, and there is very little soot or smoke, the smoke being very light in color; also that the coal is hard, stands transportation excellently, and breaks with a lustrous hackly fracture. A quantity was mined and tested in some of the interisland transports with favorable results. Upon an estimated consumption of 200,000 tons per year by the Philippine government, the Army and the Navy together, it was believed that the small area covered by the drills, one-half square mile, promised production of supply for thirty-eight years, and by the conclusions based upon the investigation as to the total amount of coal on the reservation, it was thought the period of production would extend 384 years.

The location of the mines is reported as almost ideal. The deposits may be entered but a few hundred feet from the seashore, and a haul of 300 yards from the mines is all that is necessary to lay the coal on board ship or in storage contiguous to the wharves. The harbor features are excellent, probably the best in the islands. Ships of any draft may enter with safety, the harbor being perfectly protected at all seasons from all winds. Docks can be constructed with no unusual expense which will accommodate vessels of any size. The location is such that the advantages of this point over any other for a coaling station are great. It is more or less centrally located as regards the other islands of the Philippine group; is but 50 miles off the regular route of the transports coming from the United States, and but 15 miles from Legaspi and Tabaco, one of which ports will be made the southern terminus of the railroad system now proposed for the island of Luzon. The timber supply is reported to be inexhaustible and limestone for construction purposes abundant. It is estimated that by establishing a mine and coaling station at this point an aggregate saving would be effected to the three branches of the Government, based on the present consumption and the present price of coal at Manila, of $570,000 per year.

The military authorities of the division were exceedingly anxious to purchase the concessions, for which options had been obtained, and proceed at once to development of the prospect, but there was no appropriation of this Department available for the purpose, and purchase could only be made by authority of Congress.

After this condition was explained effort was made to have the insular government of the Philippine Islands take over the options. Upon consideration of the matter the Philippine Commission declined to take such action by a resolution adopted April 17, 1905, as follows:

> *Resolved,* That it is deemed by the Commission inexpedient for the insular government to avail itself of the option now held by the military authorities upon said coal lands or to purchase said lands, in view of the fact that it lacks the necessary funds for the development of the property, and moreover is indisposed to go into the coal-mining business * * *

Estimate for funds to purchase the concessions, on which options are held for $50,000, will be submitted to be transmitted to Congress as an item in the urgent deficiency bill as purchase must be made, if at all, before March 6, 1906.

## SUPPLY DEPOTS.

Requisitions for clothing and equipage and for supplies such as the quantities to be periodically issued are fixed by regulations or orders are now revised at the different department headquarters and sent direct to a designated depot for supply on authority of the department commander, instead of through this office as formerly. For the supply of clothing, the Philadelphia and San Francisco depots have been designated for those posts coming within the territory most accessible to each. For other supplies, some one of the general depots of the Quartermaster's Department has been designated, depending upon the lines of transportation to the territory to be supplied and the most available source of supply of particular articles. Purchases of stock for supply from these depots have been regulated so as to provide for using up accumulations and the large quantities carried over from the Spanish war stores, and carry on hand only sufficient to insure meeting current requirements. Purchases at department headquarters and at local points have also been authorized and encouraged of supplies of such nature as could be bought to advantage. This policy has resulted in largely clearing storehouses at the general depots of accumulated stocks, lessening the liability to losses through deterioration and releasing storage space much needed for the handling of fresh supplies, purchased at the best obtainable prices, and considerably reducing the clerical work of this office.

## UNIFORMITY IN ADVERTISEMENTS FOR SUPPLIES.

With a view to precluding any reasonable grounds for complaint on the part of prospective bidders for supplies to be furnished the Department, I have directed that there be absolute uniformity of advertisements, circulars, and instructions to bidders which may be issued from the various purchasing depots. Drafts of advertisements, circulars, instructions to bidders, etc., have been furnished each depot quartermaster for his guidance, and the hour for opening of bids is fixed with regard to the differences in time, so that openings are simultaneous throughout the United States, thus placing bidders in all parts of the country on an absolutely equal basis before the Department. This rule is to apply to all classes of supplies where bids are called for at two or more depots for the same class.

## TRANSPORTATION.

The following statement shows that during the fiscal year ended June 30, 1905, transportation was furnished, exclusive of the Philippine Islands and of army transport service, for 1,744,476 persons, 17,579 animals, and 246,526 tons of material.

| | Railroad. | Water. | Wagon. | Stage. | Government vessels.[a] | Total. |
|---|---|---|---|---|---|---|
| Passengers: | | | | | | |
| Officers | 7,258 | 1,531 | 1,138 | 59 | 62,303 | 72,289 |
| Enlisted men | 122,366 | 30,185 | 722 | 627 | 1,518,287 | 1,672,187 |
| Total | 129,624 | 31,716 | 1,860 | 686 | 1,580,590 | 1,744,476 |
| Animals: | | | | | | |
| Horses | 15,021 | 573 | .......... | .......... | 274 | 15,868 |
| Mules | 1,300 | 307 | .......... | .......... | 104 | 1,711 |
| Total | 16,321 | 880 | .......... | .......... | 378 | 17,579 |
| Stores: | | | | | | |
| Subsistence ....tons | 21,727 | 7,146 | 5,639 | .......... | 7,763 | 42,275 |
| Quartermaster ....do | 28,116 | 25,099 | 27,200 | .......... | 15,064 | 95,479 |
| Ordnance ....do | 20,115 | 6,281 | 2,180 | .......... | 3,607 | 32,183 |
| Medical ....do | 1,332 | 318 | 661 | .......... | 258 | 2,569 |
| Signal ....do | 2,475 | 927 | 264 | .......... | 74 | 3,740 |
| Miscellaneous ....do | 27,151 | 2,959 | 22,501 | .......... | 16,769 | 70,280 |
| Total | 100,916 | 42,730 | 58,445 | .......... | 43,535 | 246,526 |

[a] Includes all passengers carried on Government ferryboats plying between military posts and adjacent cities.

A comparison of the above statement with that of the fiscal year 1904 shows a marked increase in the number of passengers and animals shipped, which is largely due to changes of station and transfer of troops between the United States and the Philippines. An increase in the quantity of supplies transported is also shown for all departments except the Quartermaster's, which shows the marked decrease of 39,130 tons. An increase in the quantity of miscellaneous supplies shipped, amounting to 16,629 tons, is also due to changes of station and transfer of troops to and from the Philippines. In handling these movements of troops and supplies it has been the policy of the Department to do so in the most economical manner possible. Under existing orders troops proceeding to the Philippines prepare their heavy baggage, and such allowances of furniture and organization property as they are entitled to transportation for, a sufficient time in advance so that it may be shipped by freight to reach San Francisco in time to go to Manila on the same transport with the troops. By this method advantage is taken of freight rates, whereas if shipments were made on the same trains with troops, as has sometimes been desired, express or excess baggage rates would have to be paid, thereby enormously increasing the cost of this service. The officers and men can, of course, have the usual amounts of baggage allowed by railroad companies shipped by the same trains on which they travel, and in the case of officers the field allowance may also be shipped by the same trains as excess baggage at Government expense, provided officers certify that it is necessary that it should accompany them. If discretion is used no inconvenience can result from this arrangement, and on arrival in

Manila the organization and its property and the personal property of its members are together and have been handled in the most economical manner.

Payments made during the fiscal year, exclusive of the Philippine Islands, on account of rail, water, wagon, and stage transportation were as follows: Funds of the fiscal year 1902, $134.52; fiscal year 1903, $76,115.85; fiscal year 1904, $1,081,711.44; fiscal year 1905, $2,051,092.45. Outstanding accounts reported unpaid June 30, 1905, for above purposes were as follows: Funds of the fiscal year 1902, $184.20; fiscal year 1903, $4,434.02; fiscal year 1904, $87,680.41; fiscal year 1905, $1,175,354.86.

Among the principal items of expenditure reported for the fiscal year 1905 were the cost of maintenance and operation of vessels of the harbor and artillery service, $638,351.73; vessels chartered and hired for same service, $99,891.04; vessels constructed and purchased, $913,311; shipments in deep-sea vessels, $147,292.23; rent of wharves, docks, and landings, $43,441.97; principal movements of troops changing station, attending ceremonies, etc., $510,809.17; to Manila under written agreement, $16,044.92; street-car and ferry tickets, $10,782.10, all of which were from the appropriation for transportation of the Army. The cost of cable and telegraph service was $43,483.39, and for rent of telephones, $30,903.55, paid from the appropriation for incidental expenses. Cable and telegraph service in the Philippines are reported to have cost $13,703.90.

The number of passengers and quantity of stores for which transportation was furnished by the Quartermaster's Department in the Philippines, by water and rail, is as follows: 9,193 officers and other first-class passengers; 52,981 enlisted men and other second-class passengers; total, 62,174; 492 animals; 298,299 tons of freight.

## CONSTRUCTION OF QUARTERMASTERS' STEAMERS.

During the fiscal year 18 harbor steamers and launches were under construction, 15 of which were completed prior to June 30, 1905.

Four 150-foot twin-screw steel steamers, named *General Henry J. Hunt*, *General Henry Knox*, *Colonel George Armistead*, and *Major Samuel Ringgold*, for use in connection with the submarine mine service, coast artillery, were built at Philadelphia, Pa., at a contract cost of $122,000 each, and placed in service September, 1904.

Two 130-foot single-screw standard steel steamers, named *General Nathanael Greene* and *General Thomas S. Jesup*, for harbor service of the Department, were built at Wilmington, Del., at a cost of $76,900 each, and placed in service in the harbors of New London and Boston in July and August, 1904, respectively.

One 105-foot wooden artillery steamer, named *Major Evan Thomas*, for service in the Puget Sound district, was built at Seattle at a cost of $21,825 and placed in service in August, 1904.

Three 110-foot single-screw standard steel steamers, for harbor service, were constructed at Philadelphia, at a total contract cost of $176,000. One of these steamers, named *General Robert Swartwout*, was completed on June 26, 1905, and assigned to the freight and passenger transportation service of the Narragansett artillery district; the two others, named *General Timothy Pickering* and *General R. N.*

*Batchelder*, were nearly completed at the end of the fiscal year and had been given their official trial trips, which were very successful in every way.

Four 60-foot standard post launches of wooden construction, for general transportation and artillery service, were constructed at Camden, N. J., at a total contract cost of $38,200. These launches were completed ready for service in June, 1905, and were named *Lieutenant Jules G. Ord*, *Captain T. W. Connell*, *Captain B. N. Hartshorne*, and *Lieutenant Edwin A. Bumpus*, and were assigned to service at Fort Mansfield, R. I., Fort Greble, R. I., Fort Rodman, Mass., and Fort Banks, Mass., respectively.

Three 28-foot electric cutters, for use in connection with the submarine-mine steamers, were constructed at Bayonne City, N. J., at cost of $2,575 each, and were assigned to the steamers for which they were constructed.

Contract for the construction, at Seattle, of one 105-foot single-screw wooden artillery steamer, for service in San Francisco artillery district, was entered into February 15, 1905, at a cost of $24,886, to be completed in five months. The work on this steamer has progressed rapidly and was near completion at the close of the fiscal year. This steamer was named *Lieutenant George M. Harris*.

There were also constructed 138 submarine-mine work boats of 20-foot length, for use at various artillery posts, at a total contract cost of $29,680.

### BOATS PURCHASED.

The 55-foot cabined steam launch *Gladys*, of Stonington, Conn., was purchased in September, 1904, for $2,300, for the freight and passenger transportation service of the post of Fort Mansfield, R. I., to replace the open launch *Mansfield*, which had been assigned to that post and which was unsuitable for the winter service there and desired for artillery purposes during drill season elsewhere. The *Gladys* was afterwards renamed *Lieutenant Bernard*.

One 30-foot power dory was purchased in March, 1905, for $575 for artillery purposes at Fort De Soto, Fla.

In the naming of all vessels built or purchased this Office has endeavored to honor the memory of distinguished quartermasters-general for steamers used principally for transportation purposes, and to honor the memory of distinguished officers of the line who lost their lives in action for the steamers used principally for artillery purposes.

### VESSELS SOLD.

The steam lighter *Kearney*, which, since the withdrawal of troops from Cuba in May, 1901, was used by the Engineer Corps for service at the Engineer School, Washington Barracks, D. C., being no longer required by them, and being unsuited for further use by the Quartermaster's Department in the harbor service, was, with the approval of the Secretary of War, advertised and sold at public auction at Washington, D. C., on November 17, 1904, for $1,569.94.

The stern-wheel steamers *General Van Vliet* and *Lieutenant Smith*, stationed at Fort Gibbon, Alaska, having proved too expensive of operation for the services required of them, were, with the approval of the Secretary of War, advertised and sold at public auction at the opening of navigation, in May, 1905, the amount received for the *General Van Vliet* being $3,012 and for the *Lieutenant Smith* $500.

### DESCRIPTION OF STANDARD STEAMERS OF THE HARBOR AND COASTWISE SERVICE OF THE QUARTERMASTER'S DEPARTMENT.

The harbor boat service is organized and furnished by the Quartermaster's Department primarily for the administrative needs and for meeting the requirements of artillery drill in the vicinity of the various artillery posts. However, in designing these vessels, it has also been constantly borne in mind that their greatest value, while an exceptional one, would be found in case of the necessity at any time for active, warlike preparations or administration. The torpedo planters would then be at once used for their special duties of mining the ports and harbors of the coast.

The first and second class harbor boats have been so constructed that it is practicable for those of the first class to cross the ocean under their own steam in almost any weather and be available as lighters for use of an expeditionary force. Each will carry as a lighter one battallion of infantry with necessary field impedimenta.

The second-class vessels can, similarly, accompany such a force anywhere on the Atlantic coast, or to the West Indies and neighboring islands, and under favorable conditions could accompany such a fleet to a greater distance.

The great advantage to be had in utilizing the harbor boats of the first and second class in this manner, in case the necessity arises, can readily be appreciated when it is stated that had such a fleet been available to accompany the expedition to Santiago in the late Spanish war, the difficulties of landing could have been much reduced and undeserved criticism, as well as hardship, would have been spared. These vessels possess the advantage of being officered and operated by employees of the Department and being wholly under military control, the masters of such vessels would serve the interests of the expedition and Government rather than hamper operations through anxiety to avoid risk of their owners' property. The harbor service of these vessels can easily be temporarily replaced as they are withdrawn from the harbors. There are now nine such vessels available on the Atlantic coast and two on the Pacific.

*First-class torpedo planters.*—These vessels are of double-bottom, steel construction, their hulls being divided into five water-tight compartments. The principal dimensions are length, 150 feet; beam, 30 feet; draft, 9 feet 6 inches; the propelling power consisting of two compound vertical condensing engines with cylinders 13 inches and 16 inches diameter by 22 inch stroke, developing approximately 1,100 horsepower. Steam is supplied by two horizontal Scotch boilers, each having three Morrison suspension furnaces, at a working pressure of 150 pounds per square inch.

These steamers are for service in planting submarine mines and torpedoes, and for instruction purposes in connection with such work at artillery posts along the Atlantic coast. They have a freight capacity of about 60 tons, with stores for a crew of about 40 men. Living accommodations, such as berthing quarters, lavatories, galleys, and mess rooms, are provided for the ship's crew and 20 enlisted men; also cabins, dining saloon, bath room, pantry, etc., for three army officers.

The auxiliary machinery of these steamers consists of electric lighting plant and searchlight, extensive hoisting apparatus, steam windlass, steam steering gear, sanitary and fresh water pumps for supplying running salt and fresh water throughout vessel, boiler feed pumps, independent air pumps, centrifugal circulating pumps, and donkey bilge and fire pumps.

*Second-class torpedo planters.*—These vessels are of steel construction with principal dimensions as follows: length, 85 feet; beam, 18 feet; draft, 7 feet 6 inches; the hulls being subdivided into five water-tight compartments. All construction above main deck is of wood. The propelling power consists of two compound vertical condensing engines driving twin propellers, the steam being supplied by one horizontal Scotch boiler, with two Morrison furnaces, at a working pressure of 150 pounds per square inch.

These steamers are for general service in artillery work, instruction work in planting submarine mines, similar to the first-class planters; also for vessel tracking, towing regular service and subcaliber targets for artillery drills; dispatch service, searchlight drill, transportation of officers and men, as required by the district commander; and for the work in connection with semimonthly inspections, visits of officers to subposts, visits of district staff in execution of official duties, visits of ceremony by district commanders, etc. These steamers have a freight capacity of about 15 tons on deck and in forward hold, and a passenger capacity of about 100.

The auxiliary machinery of this class of steamers is practically of the same character as that of the first-class planters above described. Forecastle accommodations are provided for a crew of 5 firemen and deck hands, the full crew consisting of 7 men.

*First-class harbor steamers.*—These vessels are also of steel construction, with principal dimensions as follows: Length, 130 feet; beam, 27 feet; draft, 9 feet. They are subdivided by four water-tight steel bulkheads and are propelled by single screw driven by compound vertical condensing engines 20 inches and 40 inches diameter, 24-inch stroke, developing about 720 horsepower. Steam is supplied by two horizontal Scotch boilers, with two Morrison furnaces each, under a working pressure of 150 pounds per square inch.

The auxiliary machinery is practically the same as that of the torpedo planters.

These vessels are for service in the transportation of troops, passengers and general freight, mail, supplies, water, etc., between coast-artillery posts and their neighboring cities. The boats are designed principally for harbor service, but are of good ocean-going model, which enables them to be used for coastwise service or as lighters in connection with over-sea expeditions should they be required.

They have a freight capacity of from 45 to 60 tons on deck and in the forward hold, and a passenger capacity of about 300. Living accommodations are provided for a crew of 12 men.

*Second-class harbor steamers.*—These vessels are also of steel construction very similar to the first-class vessels above described, except that they are 20 feet shorter, their principal dimensions being length, 110 feet; beam, 24 feet; draft, 8 feet 9 inches. They are propelled by single screw driven by compound vertical condensing engines developing about 600 horsepower. The steam is supplied by one horizontal marine Scotch boiler, with three Morrison furnaces, at a working pressure of 150 pounds to the square inch.

The auxiliary machinery, with the exception of steam hoisting apparatus, is practically the same for these vessels as for harbor steamers of the first class.

These vessels are for general transportation purposes at artillery posts, transporting troops, passengers, and general freight, mail, supplies, water, etc., and are used at posts where the large capacity of a first-class steamer is unnecessary. Their freight capacity is about 35 to 45 tons on deck and in the forward hold, and their passenger capacity is about 225. Forecastle accommodations are provided for a crew of 7 firemen and deck hands, the full crew consisting of 11 men.

*Third-class harbor steamers.*—The vessels of this class thus far constructed are of wood, instead of steel. The principal dimensions are, length, 85 feet; beam, 20 feet; draft, 7 feet 6 inches. They are propelled by single screw driven by compound condensing vertical engine developing about 300 horsepower, steam being supplied by one safety water-tube boiler, or one marine Scotch boiler, as desired, at a working pressure of 150 pounds per square inch.

These steamers are for general transportation purposes at the smaller coast artillery posts where vessels of a larger class are not required. They are of similar design to the first and second class steamers, so far as practicable, and have a freight capacity of 12 to 15 tons and a passenger capacity of about 75. The crew consists of 6 men, 4 of whom are furnished quarters in the forecastle.

*First-class or 60-foot cabined launches.*—These launches are single-screw wooden steamers housed in for about 45 feet of their length with the usual launch trunk cabin of mahogany and glass. The hulls are subdivided into four water-tight compartments by steel bulkheads. The principal dimensions of the hulls of these boats are: Length, 60 feet 6 inches; beam, 12 feet 2 inches; draft, 4 feet 3 inches. The entire framework, ribs, knees, beams, etc., are of the best quality white oak; planking, hard pine; decks of white pine. The propelling power consists of one compound vertical condensing engine with cylinders 6-inch and 12-inch diameter by 10-inch stroke, developing about 116 horsepower, steam being supplied by a water-tube boiler of 525 square feet heating surface at a working pressure of 175 pounds to the square inch. There are the usual feed pumps in duplicate, centrifugal circulating pump, and horizontal air pump; also an injector for boiler feed.

These launches are for service in the transportation of passengers and package freight, mail, commissary supplies, etc., at posts where larger vessels are not required; also for artillery service such as towing subcaliber targets, vessel tracking, dispatch service, searchlight drills, official visits, etc., as required by regulations. They have a capacity of from 2 to 2½ tons package freight, 10 officers and 40 to 50 troops. Crew consists of 1 pilot, 1 engineer, and 1 deck hand.

*Second-class launches.*—These boats are constructed of wood throughout with the exception of steel water-tight bulkheads which divide their hulls into three water-tight compartments. The principal dimensions are: Length, 45 feet; beam, 9 feet; draft, about 3 feet 6 inches. They are provided with canvas canopy and side curtains on metal frame over the cockpit throughout the principal length of the boat. The propelling power consists of one triple expansion vertical condensing engine with cylinders 7-inch and 11-inch in diameter by 8-inch stroke, steam being supplied by water-tube boiler at a working pressure of 175 pounds to the square inch. The material of construction of these launches is the same as that of the first-class launches and the boats are used for the same general transportation and artillery purposes. They have a passenger capacity of about 30 and freight capacity (in small packages that can be lifted by two men) of about 1½ tons. The crew consists of 1 pilot and 1 deck hand.

*Third-class launches.*—These launches are of wooden construction, from 30 to 40 feet in length, their beam being about 8 feet and draft 3 feet. The machinery is practically the same in all of these boats. Canvas canopy and side curtains on metal frame cover an open cockpit throughout the principal length of the boat.

These launches are used principally for artillery purposes, as described for first-class launches, their passenger capacity being about 20 to 30 men, and freight capacity, limited to small packages, to the extent of about one-half to three-fourths of a ton.

*Cable steamer Cyrus W. Field.*—This vessel is employed in laying and repairing submarine cable for the Signal Corps at artillery posts along the Atlantic coast, and is of the same class as torpedo planters, although of wooden construction throughout. The principal dimensions are: Length, 121 feet; beam, 30 feet 7 inches; draft, about 10 feet. The propelling power consists of two tandem compound vertical engines driving twin screws and developing about 600 horsepower, steam being supplied by two flue boilers. The vessel is fitted with living accommodations for a crew of about 30 men, these accommodations consisting of berthing quarters, lavatories, galley, mess room, etc. There are also accommodations for Signal Corps officer and ship's crew.

*Statement of operating expenses of vessels in harbor and artillery service during fiscal year 1905.*

| Name of vessel. | Where stationed. | Wages of crews. | Supplies and incidentals. | Repairs. | Total. |
|---|---|---|---|---|---|
| Torpedo planters: | | | | | |
| General Henry J. Hunt. | Fort Totten, N. Y | $13,562.51 | $8,941.86 | $2,046.50 | $24,550.87 |
| General Henry Knox | do | 11,317.62 | 9,401.11 | 972.27 | 21,691.00 |
| Colonel George Armistead. | Atlantic coast | 11,160.35 | 14,083.65 | 2,443.46 | 27,687.46 |
| Major Samuel Ringgold. | do | 10,779.62 | 13,211.20 | 733.91 | 24,724.73 |
| First-class passenger steamers: | | | | | |
| General Joseph E. Johnston. | New York City | 11,259.96 | 9,719.94 | 1,454.34 | 22,434.24 |
| General Nathanael Greene. | Fort Trumbull, Conn | 8,759.54 | 9,518.90 | 671.92 | 18,950.36 |
| General Thomas S. Jesup. | Boston, Mass | 8,563.77 | 6,873.23 | 626.33 | 16,063.33 |
| General Meigs | New York City | 11,271.00 | 8,140.99 | 26,796.02 | 46,208.01 |
| General Mifflin | San Francisco, Cal | 12,643.83 | 13,796.12 | 1,861.16 | 28,301.11 |
| General McDowell | do | 12,711.34 | 10,410.27 | 4,567.98 | 27,689.59 |
| Second and third class passenger steamers: | | | | | |
| Henry Wilson | Fort Williams, Me | 8,923.17 | 6,207.45 | 1,675.34 | 16,805.96 |
| Sprigg Carroll | Fort Howard, Md | 8,818.49 | 6,230.76 | 2,971.67 | 18,020.92 |
| General French | Fort Moultrie, S. C | 5,382.20 | 2,019.40 | 4,341.02 | 11,742.62 |
| General Hancock | Governors Island, N. Y | 11,142.25 | 9,601.43 | 2,014.13 | 22,757.81 |
| General Barry | Fort Slocum, N. Y | 3,487.40 | 3,286.76 | 6,116.90 | 12,891.06 |
| General Howe | Fort Du Pont, Del | 2,139.93 | 1,725.95 | 9,807.32 | 13,673.20 |
| General Jeff. C. Davis | Fort St. Michael, Alaska | 3,588.94 | 240.00 | | 3,828.94 |
| Major Guy Howard | Fort Stevens, Oreg | 5,645.84 | 2,106.44 | 2,732.55 | 10,484.83 |
| Cartwright | Seattle, Wash | 7,365.51 | 2,912.13 | 662.59 | 10,940.23 |
| Major Evan Thomas | Fort Worden, Wash | 5,180.00 | 3,707.18 | 1,952.69 | 10,839.87 |
| General Van Vliet | Fort Gibbon, Alaska | 4,079.15 | 1,885.22 | 800.00 | 6,764.37 |
| Lieutenant Smith | do | 1,830.00 | 958.50 | | 2,788.50 |
| Tugs: | | | | | |
| Reno | Fort Monroe, Va | 5,955.72 | 2,337.79 | 670.00 | 8,963.51 |
| Gibbon | Fort Washington, Md | 4,381.66 | 3,726.34 | 2,508.28 | 10,616.28 |
| Lieutenant Alonzo H. Cushing. | Fort Dade, Fla | 7,059.96 | 5,029.23 | 1,179.60 | 13,268.79 |
| Captain Reilly | Boston, Mass | 3,800.00 | 2,430.94 | 1,942.69 | 8,173.63 |
| Captain Drum | Fort Adams, R. I | 3,761.76 | 2,689.10 | 1,428.75 | 7,879.61 |
| Colonel Wikoff | Governors Island, N. Y | 3,780.91 | 2,352.98 | 1,353.00 | 7,486.89 |
| Petersen | Fort Wm. H. Seward, Alaska. | 5,055.00 | 2,840.68 | 16.05 | 7,911.73 |
| Weitzel | Fort Williams, Me | 5,880.00 | 2,921.50 | 3,825.14 | 12,626.64 |
| Lighters: | | | | | |
| Baker | Fort Barrancas, Fla | 5,437.48 | 5,781.27 | 4,675.36 | 15,894.11 |
| Captain Godfrey | Fort Totten, N. Y | 220.90 | 396.75 | 364.09 | 981.74 |
| Canby | New York City | 10,529.66 | 6,136.41 | 353.11 | 17,069.18 |
| Poe | Fort Barrancas, Fla | 5,165.66 | 3,095.68 | 1,471.13 | 9,732.47 |
| Williams | New York City | 8,400.44 | 2,502.59 | 8,474.63 | 19,377.66 |
| Cyrus W. Field | Atlantic cable boat | 11,153.80 | 9,188.23 | 21,824.24 | 42,166.27 |
| Kearney | Washington, D. C | 619.66 | 4.15 | | 623.81 |
| Launches: | | | | | |
| Colonel Elder | Fort Fremont, S. C | 1,095.60 | 358.90 | 726.06 | 2,180.56 |
| General De Russey | Fort Rosecrans, Cal | 2,535.50 | 1,193.38 | 474.40 | 4,203.28 |
| Colonel Mitchell | Governors Island, N. Y | 228.33 | 22.20 | | 250.53 |
| Captain Page | Fort Morgan, Ala | 1,658.92 | 587.10 | 2,463.91 | 4,709.93 |
| Lancaster | Fort St. Philip, La | 1,101.50 | 1,310.92 | 115.82 | 2,528.24 |
| Mansfield | Fort H. G. Wright, N. Y | 1,697.82 | 509.56 | 703.00 | 2,910.38 |
| Alcatraz | Alcatraz Island, Cal | 1,440.50 | 1,416.94 | 796.95 | 3,654.39 |
| Captain Watson | Fort Hamilton, N. Y | 741.70 | 822.26 | 22.50 | 1,586.46 |
| Captain De Hart | Fort Warren, Mass | 1,169.95 | 578.07 | 656.90 | 2,404.92 |
| Lieutenant Crosby | Fort Caswell, N. C | 981.35 | 516.54 | 254.92 | 1,752.81 |
| Lieutenant Michie | Fort Liscum, Alaska | 2,400.00 | 580.57 | 70.55 | 3,051.12 |
| Lieutenant Elliot | Port Townsend, Wash | 2,706.00 | 455.51 | 520.00 | 3,681.51 |
| Lieutenant Haslett | Fort Schuyler, N. Y | 1,488.01 | 353.25 | 421.64 | 2,262.90 |
| Captain Smead | Fort McDowell, Cal | 1,412.54 | 403.93 | 1,103.50 | 2,919.97 |
| Colonel Mendenhall | Fort Barrancas, Fla | 1,061.00 | 664.11 | 472.77 | 2,197.88 |
| Colonel Ramsey | Fort Preble, Me | 1,778.40 | 868.25 | 341.66 | 2,988.31 |
| M. G. Krayenbuhl | Fort Monroe | 833.33 | 127.21 | 67.20 | 1,027.74 |
| Mercedes | Washington, D. C | 357.50 | 6.95 | | 364.45 |
| Pleasanton | Fort Dade, Fla | 496.00 | 130.58 | 208.58 | 835.16 |
| Wilkerson | Fort Howard, Md | 520.60 | 106.16 | 761.08 | 1,387.84 |
| Lieutenant Burnham | Key West, Fla | 1,269.86 | 253.66 | 275.91 | 1,799.43 |
| Haskell | Fort St. Michael, Alaska | 1,492.66 | 280.00 | | 1,772.66 |
| Lieutenant Wansboro | Fort Totten, N. Y | | | 149.50 | 149.50 |
| Colonel Hamilton | Fort Constitution, N. H | 1,920.75 | 531.19 | 446.62 | 2,898.56 |
| Lieutenant Bernard | Fort Moultrie, S. C | 511.93 | 197.26 | 1,115.00 | 1,824.19 |
| West Point | West Point, N. Y | 9.10 | | | 9.10 |
| No name | Fort Strong, Mass | 76.50 | 18.00 | 294.08 | 388.58 |
| Total | | 291,800.38 | 208,754.63 | 137,796.72 | 638,351.73 |

During the fiscal year there was expended in addition to the above for hire or charter of vessels for use in harbor and artillery service for quartermaster purposes $79,475.06; for artillery purposes $20,415.98; a total of $99,891.04.

From the foregoing it will be noted that a very considerable portion of these expenditures was incurred in connection with the work of the Artillery Corps. Drafts on the appropriations of this Department for expenses connected with land batteries, fire control, submarine-mine work, operation of searchlights, power plants, etc., in the operation of the coast-defense system are already very heavy, and as it is developed and perfected must increase. Those here noted draw, in the main, upon the appropriation for transportation of the Army, but there are others for fuel, oil, engine supplies, etc., which draw heavily upon the appropriation for regular supplies. Already both these appropriations have been so reduced as to be inadequate to meet many important demands, and it is believed the particular attention of Congress should be invited to this matter with a view to securing for the Department sufficient funds to insure efficiency in operations of this nature. The work is too important and the machinery and apparatus too valuable for the one to be trammeled or the other allowed to deteriorate for lack of funds.

### SHIPMENTS IN DEEP-SEA COMMERCIAL VESSELS.

*Statement showing freight and passenger transportation in deep-sea Commercial Vessels during the fiscal year 1905.*

SHIPMENTS IN AMERICAN VESSELS.

| Destination. | General-merchandise, forage, etc. | Animals. | Lumber. | Passengers. | Cost. |
|---|---|---|---|---|---|
| | *Tons.* | | *Feet.* | | |
| Manila | 495 | | 1,982,465 | 8 | $18,669.82 |
| Cuba | 277 | | | 1 | 384.40 |
| Porto Rico | 933 | | 400 | 9 | 7,716.68 |
| Alaska | 4,120 | | 732,804 | 93 | 100,070.49 |
| Other ports | 90 | 1 | | | 958.96 |
| Total | 5,915 | 1 | 2,715,669 | 111 | 127,800.35 |

SHIPMENTS IN FOREIGN VESSELS.

| | | | | | |
|---|---|---|---|---|---|
| Manila | 1,767 | | | | $18,685.75 |
| Other ports | 94 | | | | 806.13 |
| Total | 1,861 | | | | 19,491.88 |

TOTAL SHIPMENTS, AMERICAN AND FOREIGN VESSELS.

| | | | | | |
|---|---|---|---|---|---|
| Manila | 2,262 | | 1,982,465 | 8 | $37,355.57 |
| Cuba | 277 | | | 1 | 384.40 |
| Porto Rico | 933 | | 400 | 9 | 7,716.68 |
| Alaska | 4,120 | | 732,804 | 93 | 100,070.49 |
| Other ports | 184 | 1 | | | 1,765.09 |
| Total | 7,776 | 1 | 2,715,669 | 111 | 147,292.23 |

Shipments largely in excess of those here reported for American vessels were tendered the contractors at both San Francisco and Seattle, but declined on the ground that space had all been engaged for commercial trade and the carriers could not afford to displace such goods with Government supplies. In no case has this Department been able to stipulate for preference of army stores in shipments on commercial vessels even to meet military necessities. Fortunately, an extra transport was available to handle accumulated supplies, for which had dependence been solely on private lines we would have been hard pushed to find means of shipment.

It will be noted from the foregoing statement that with the exception of 1,767 tons of freight shipped to Manila and 94 tons to miscellaneous foreign ports no shipments were made in other than vessels of American register. The shipments to Manila in foreign vessels were from the port of New York exclusively, although every effort has been made to secure shipment from there in American bottoms. Invitations to bid were widely distributed both by circular proposal and newspaper advertisement, but in all cases American shipowners refused to bid, stating that as the coastwise laws of the United States had not been extended to the Philippine Islands, it was impracticable to compete with foreign bottoms for this service.

The shipments in foreign bottoms to other ports were small and scattering consignments to representatives of the Government located in various foreign countries to which no American transportation was available.

### TRANSPORTATION FOR OTHER DEPARTMENTS.

In accordance with the provisions of law (23 Stat. L., 110), this Department receives and transports property turned over to it by other departments of the Government, payment being made by the Department requesting the shipment. Heretofore it had been the practice to require accounts for shipments under this law to be forwarded to this office for transmittal to the proper department for payment. The volume of this business is constantly increasing, and that method of handling accounts involved a great deal of useless labor in this office. Of the 5,882 transportation accounts, aggregating $716,543.91, transmitted through this office during the year for settlement, over four-fifths, or 4,700 of them, amounting to $341,350.54, were transmitted to other Executive Departments for settlement from their appropriations, in payment for shipments made for them.

To relieve this office of the useless labor incident to the merely formal transmission of these accounts through this office, instructions were issued to all quartermasters, by circular No. 24 of this office, September 12, 1905, to discontinue the former practice and forward such accounts direct to the proper official of the Department concerned, notifying the carrier of this action and that future correspondence relating thereto should be had with such official.

No additional work is entailed on the other departments or upon the shipping officers by this method, while this office is relieved of the former purely perfunctory handling of this considerable volume of business and enabled to utilize the services of the clerks engaged upon it in other directions where urgently needed.

### CENTRAL OFFICE FOR SETTLEMENT OF TRANSPORTATION ACCOUNTS.

The clerical work of preparation, verification, and settlement of transportation accounts, especially those which involve free, land-grant, or bond-aided railroads, is one of the most difficult and the most voluminous task which this Department is called upon to perform. In addition to its own very large transportation requirements the Department is required by law to provide transportation for the property and supplies of all other Executive Departments and prepare the accounts in duplicate for such service.

Under the present arrangement, which has prevailed for many years, railroad companies present their accounts to quartermasters stationed at New York, Boston, Philadelphia, Washington, Chicago, Omaha, San Antonio, St. Paul, Atlanta, St. Louis, Jeffersonville, Denver, San Francisco, Portland, Oreg., or Seattle, according to the territory in which the road receiving payment operates. This system, the growth of years, is based upon the idea that these accounts can be better and more expeditiously settled at offices where quartermasters can, personally, conduct business with the railroad officials, which is believed to be erroneous and in any event to be offset by the disadvantages of maintaining a large force of clerks to handle the business at each point some of whom must be expert in the adjustment of freight and passenger traffic rates, the differences of construction of laws, decisions, and regulations which arise among offices acting in the semiindependent manner prevailing, and the fact that all business is subject to revision by the Auditor for the War Department in Washington. In the review of these accounts by the Auditor numerous vexatious questions of rates, tariffs, divisions, prorating, shortages, deductions, etc., are constantly arising which, even when involving only a few cents, require the same care and attention as though thousands of dollars were involved.

No doubt the present system has desirable features, but it is believed that they would be more than counterbalanced by the advantages that would result to all interested through concentrating all this work in a central office. The Quartermaster's Department would be enabled to assemble in such an office all of its clerks now engaged on this work in the scattered offices and place them under one competent head, so that there would be constant, continuous, and consistent method in handling such matters, and the administrative examination of these accounts by the Quartermaster-General's Office would be very much facilitated. The continuous and repeated filing of and reference to classifications, tariffs, rate sheets, circulars, etc., which is now being duplicated and repeated by the various quartermasters, would cease. The rulings of the accounting officers of the Treasury would be coded and available for reference, and precedents would be established which would enable the present large volume of vexatious correspondence to be considerably reduced.

Under the present system similar mistakes, or misunderstandings, occur at widely separated points, at different times, and affecting the accounts of different railroads. These are being continually thrashed out and rehandled by many men of many minds—officers, clerks, and railroad accountants. With a central bureau this would be avoided, as a point once well settled would become a precedent and the correspondence on which it was settled could be readily turned to and copies thereof furnished to those interested, thus avoiding the necessity for much of the letter writing which is now the bane of this branch of the service. The time of the various disbursing quartermasters now devoted to this work and to replying to statements of differences from the Auditor would be saved and could be used to advantage for other work. It is believed that advantages would also accrue to the railroad companies, in that they would secure more prompt settlement of their accounts, find the labor of correspondence in connection with settlements lessened, and the number of deductions for slight or technical reasons greatly decreased. It is known that the companies often pay these deductions where of small amounts rather than employ the time of their clerks in hunting through old records, even though they may maintain that the deduction was incorrect in principle and should not have been made. When such a project was under consideration a few years ago, and not carried out, principally because the time was considered inopportune, a resolution was adopted by the Association of American Railway Accounting Officers recommending "that a central office for the settlement of War Department transportation matters be established;" so there is little doubt that the plan would meet with the approval of the railroad companies, and in fact their hearty cooperation.

One other advantage to be gained by the establishment of such an office would be to relieve the Treasury from the necessity of placing considerable sums to the credit of quartermasters at the various offices where these accounts are now settled in order to provide for contingencies. With a central office here in Washington, funds need only to be provided to meet the accounts examined and passed upon. What is, however, of the greatest importance to this office, under the present reduced appropriations and restrictions as to creating deficiencies, is to know the state of its appropriations from day to day, and under the system now in force it is impossible to do this to any degree of certainty with the army transportation funds. There is now no means of knowing the accounts remaining to be settled, through not being presented, awaiting adjustment of differences or various other reasons.

In view of these reasons, which I consider of great force, it is recommended that a central office for the settlement of railroad transportation accounts be established in Washington, to be in charge of a quartermaster who will be a disbursing officer of quartermaster funds, not as a branch of the Quartermaster-General's Office, but of the Department at large, on the same footing as the general depots and disbursing offices now handling this business. There would be ample accommodations for an office of this kind in the buildings of the abandoned signal corps post at Fort Myer, which would be sufficiently accessible and could be fitted up for the purpose at little expense.

## TRAVELING EXPENSES OF OFFICERS ON DEPARTMENTAL DUTY.

Last year I recommended that authority be given the Quartermaster-General to order officers of the Department, with the approval of the Secretary of War, to make necessary journeys in connection with inspections of construction, manufacture, purchase or delivery of supplies, or like matters, and to authorize payment to officers when on such duties their actual traveling expenses, in lieu of mileage, from the appropriation to which the duty performed pertained.

The object was to enable the Quartermaster-General to cause to be made closer inspection than is now possible of works of the nature outlined above and of the conduct of business of the Department at general depots or other points where important purchases or work might be in course.

We are doing construction work to the extent of millions of dollars, under the various appropriations pertaining thereto, and the officers in charge are not always as thoroughly qualified as they should be. This can not be corrected at once, if, in fact, it ever can be under the present system of details for service in a department where special knowledge and experience is important in the essential branches of its work. Our superintendents of construction, who come to us through the civil service, are men of sufficient general and technical education to pass the examination, but many of them lack experience and the practical knowledge of materials and proper handling of details of construction. Therefore the probability of inferior work being done makes necessary constant inspections at the various posts by an officer of the Department who is thoroughly conversant with those matters.

Work is going on at posts where we are spending hundreds of thousands of dollars, with nobody to properly supervise it from this point. I can not, to the extent advisable, send out our experienced officers, because largely of lack of funds for mileage, there not being sufficient to meet the general wants of the service. If the Quartermaster-General had authority, subject to approval of the Secretary of War, to send an officer to a desired point, and he could be paid his actual traveling expenses, as indicated, it would open a way for the proper and efficient supervision of matters of construction, purchase of horses, manufacture of clothing and equipage, or any other of the manifold duties the Department is constantly being called upon to perform, and enable me to have each project inspected by some officer who, from experience and study, had become an expert upon the matter in hand. As a matter of fact there ought for the past year to have been, and ought now to be, at least one officer thoroughly competent in that line, traveling all the time, looking after construction, while frequent inspections along other lines are badly needed.

A provision giving the desired authority was in the last army appropriation bill when reported to the House of Representatives from the Committee on Military Affairs, but was objected to when the bill was being considered by the House and ruled out as new legislation. It is not asking anything unprecedented, but simply to give the Department authority to handle inspections the same as the Engineer Department now has for instruction. If the provision in the appropriations for the Engineer Department "for travel expenses of officers on journeys approved by the Chief of Engineers and made for the purpose of instruction: *Provided*, That the traveling expenses herein provided for shall be in lieu of mileage and other allowances," were amended by reading "inspection" instead of "instruction" and made applicable to the various appropriations of this Department, it would be just what is desired.

With reference to the purchase of animals, especially, officers are frequently ordered to points in connection therewith involving absence from any regular station for months. In the meantime they will receive remuneration only in mileage, which is only a percentage of their actual necessary expenses. It is well known that it is the intention of the Government to meet the extra and legitimate expenses of officials when traveling on public business, but numerous instances could be cited where in the Department's work officers received but a small per cent of the outlay required of them while traveling in the interest of the Government. This is entirely wrong, and actual expenses would be no more than just as a reimbursement for expenditures made; but principally in the interest of a better oversight of its work to insure proper compliance with specifications, terms of contracts, etc., a more elastic method of ordering officers on inspections is needed, and the provision proposed would provide it.

## COMBINED ARMY AND MILITIA MANEUVERS.

During the fiscal year there were held at American Lake, Wash., in July; Atascadero, Cal., in August; and in the vicinity of Manassas, Va., in September, combined army and militia maneuvers under the provisions of the act approved January 21, 1903, entitled "An act to promote the efficiency of the militia and for other purposes," and the act approved April 23, 1904, appropriating $1,000,000 for defraying the expenses of these maneuvers of which the Secretary of War made allotments for use of the Pacific and Atlantic divisions.

These maneuvers were managed on a very extensive scale and drew heavily on this Department for all classes of supplies and services.

At the Manassas maneuvers, especially, the most elaborate preperations were made, and a force of 21,234 officers and men gathered, some of the militia coming from great distances, as shown by the States represented, viz, Connecticut, New York, Massachusetts, Maine, Tennessee, Florida, New Jersey, Virginia, South Carolina, Georgia, Alabama, Texas, Maryland, Vermont, North Carolina, West Virginia, and Delaware. The accommodations for the gathering of troops were more complete and comfortable in every way than would have been provided for actual service, and together with the rents, damages, etc., incident to securing camp sites and conducting the exercises planned and carried out cost, approximately, $50,000 in excess of the allotment for the Atlantic division. As these excess obligations were all for rents, supplies, damages, etc., which pertain to the Quartermaster's Department, this Office was obliged to reluctantly submit a deficiency estimate, which was not passed by Congress, although there is no doubt as to the equity of the claims passed upon. The estimate will be submitted again this year; but while it must come from this Office I desire it should be understood that no responsibility therefor is assumed here. This Office had no supervision or check upon the obligations incurred for these maneuvers, the whole management being in control of the major-general commanding the Atlantic Division and under his direction, therefore the deficiency is considered to have been solely due to his administration of the affairs of the division.

During May and June of this year extensive joint army and navy exercises were conducted in the Chesapeake Bay and Potomac River at a cost to appropriations of this Department of $76,986.07, as well as less elaborate exercises in other parts of the country. These movements, entailing heavy draft upon the appropriations of this Department, are, as a rule, proposed, considered, and carried out without consultation with this Office as to the state of its funds and often without notice that they will occur. It is submitted that this is a wrong practice involving this Office in the settlement of expenses of the incurrence of which it has no knowledge or opportunity to protect its appropriations and rendering it impossible to keep proper account of the funds for its use. With barely sufficient money at its disposal for the absolute necessities of the Army, and with the existing limitations as to creating deficiencies, it is becoming daily more important that this Office should be thoroughly advised in advance of all obligations the incurrence of which will draw upon its funds.

## MILITARY TELEGRAPH LINES IN ALASKA.

Fully realizing the vital importance of this work the Department has endeavored to render to the Signal Corps every possible assistance toward its success. Building material, fuel, and forage have been supplied, and means of transportation, including pack animals, dogs, and sleds have been furnished and maintained together with such packers, teamsters, etc., as have been needed. Special clothing has been provided as required, and supplies for the fiscal year 1906 shipped so as to be delivered before the close of navigation.

At Fairbanks and Chena quarters have been constructed for signal corps detachments at a cost of $2,000 and $1,491.57, respectively, and at Unalaklik a storehouse has been constructed at a cost of $300. Materials for wireless telegraph stations at Fort St. Michael and Safety Harbor have been purchased and shipped—the buildings to be completed from funds of the fiscal year ending June 30, 1906. Materials have been purchased and shipped for cabins at Workmans, Saina, Teikhel, Tonsina, Copper Center, Chestochina, and Metasta, on the first section of the line, and at Koyukuk, Birches, and Baker, on the second section.

The total expenditures by the Quartermaster's Department for this service during the fiscal year have been $157,173.77, to which should be added maintenance of the cable ship *Burnside*, $169,908.07, making a total of $327,081.84. It should be borne in mind that this is in addition to the cost of this work to signal corps appropriations.

## ARMY TRANSPORT SERVICE.

The vessels in the army transport service at the beginning of the fiscal year, together with the class, station, and the services performed during the year, are as follows:

| Name. | Class. | Service. |
|---|---|---|
| Buford | Troop ship | En route from San Francisco to Alaska. |
| Burnside | Cable ship | Engaged in laying Alaskan cable. |
| Crook | Troop ship | Out of commission, San Francisco Harbor. |
| Dix | Freight ship | In service between Pacific coast and Manila. |
| Kilpatrick | Troop ship | En route San Juan to Boston. |
| Logan | do | In service between San Francisco and Manila |
| McClellan | do | Out of commission, New York Harbor. |
| Meade | do | Out of commission in San Francisco Harbor. |
| Sheridan | do | In service between San Francisco and Manila. |
| Sherman | do | Do. |
| Sumner | do | Transporting teachers, Porto Rico to New York. |
| Thomas | do | In service between San Francisco and Manila. |
| Warren | Freight ship | Out of commission, San Francisco Harbor. |
| Slocum | Tug | In service in San Francisco Harbor. |

During the year there have been monthly sailings each way between San Francisco and Manila in addition to which the *Dix* has maintained service for carriage of freight and animals between the Pacific coast and Manila.

The sailing date of transports leaving San Francisco for Manila has been changed since the close of the fiscal year from the last to the fifth day of each month. This enables troops to be mustered and paid before sailing of the vessel, and all concerned to make necessary provisions attendant upon the close of the month. When the 5th falls on a Sunday or holiday, vessels sail on the 6th. Returning, transports leave Manila on the 15th of each month, or on the 16th should the regular day fall upon a Sunday or holiday.

### WORK OF THE TRANSPORTS.

#### OUTWARD BOUND.

| Transport. | Left San Francisco. | Officers. | Enlisted men. | Civilians. | Total. |
|---|---|---|---|---|---|
| Sherman | July 1, 1904 | 13 | 85 | 132 | 230 |
| Dix | July 26, 1904 | .......... | 1 | 32 | 33 |
| Logan | Aug. 1, 1904 | 17 | 398 | 116 | 531 |
| Thomas | Sept. 1, 1904 | 23 | 330 | 127 | 480 |
| Sheridan | Oct. 1, 1904 | 52 | 228 | 141 | 421 |
| Sherman | Nov. 1, 1904 | 26 | 44 | 148 | 218 |
| Dix | Nov. 16, 1904 | .......... | .......... | 11 | 11 |
| Logan | Dec. 2, 1904 | 23 | 94 | 432 | 549 |
| Thomas | Dec. 31, 1904 | 22 | 905 | 96 | 1,023 |
| Sheridan | Jan. 25, 1905 | 6 | 1 | 62 | 69 |
| Sherman | Feb. 1, 1905 | 56 | 1,128 | 73 | 1,257 |
| Logan | Feb. 28, 1905 | 106 | 2,030 | 93 | 2,229 |
| Buford | Mar. 16, 1905 | 97 | 1,793 | 134 | 2,024 |
| Thomas | Mar. 31, 1905 | 46 | 754 | 87 | 887 |
| Dix | Apr. 2, 1905 | .......... | .......... | 56 | 56 |
| Sherman | May 2, 1905 | 61 | 1,194 | 120 | 1,375 |
| Sheridan | May 31, 1905 | 64 | 1,144 | 105 | 1,313 |
| Total | .............. | 612 | 10,129 | 1,965 | 12,706 |

#### HOMEWARD BOUND.

| Transport. | Left Manila. | Officers. | Enlisted men. | Civilians. | Total. |
|---|---|---|---|---|---|
| Sheridan | July 15, 1904 | 33 | 281 | 184 | 498 |
| Sherman | Aug. 15, 1904 | 28 | 302 | 193 | 523 |
| Dix | Sept. 9, 1904 | 2 | .......... | 27 | 29 |
| Logan | Sept. 15, 1904 | 21 | 334 | 167 | 522 |
| Thomas | Oct. 15, 1904 | 38 | 378 | 205 | 621 |
| Sheridan | Nov. 15, 1904 | 22 | 608 | 92 | 722 |
| Sherman | Dec. 15, 1904 | 17 | 765 | 143 | 925 |
| Dix | Jan. 6, 1905 | .......... | 1 | 10 | 11 |
| Logan | Jan. 14, 1905 | 50 | 807 | 214 | 1,071 |
| Thomas | Feb. 15, 1905 | 17 | 606 | 263 | 886 |
| Sherman | Mar. 15, 1905 | 28 | 346 | 359 | 733 |
| Sheridan | Mar. 18, 1905 | 43 | 417 | 106 | 566 |
| Logan | Apr. 15, 1905 | 62 | 614 | 331 | 1,007 |
| Dix | May 6, 1905 | 2 | .......... | 43 | 45 |
| Thomas | May 20, 1905 | 81 | 1,064 | 284 | 1,429 |
| Sherman | June 15, 1905 | 68 | 942 | 219 | 1,229 |
| Total | .............. | 512 | 7,465 | 2,840 | 10,817 |

On these voyages there were also brought from the Philippine Islands for interment the remains of 364 officers, soldiers, and civilian employees, and the remains of 8 persons who had died in this country were transported to the Philippine Islands for interment.

There were transported between the United States and the island possessions 73,985 tons of freight, 3,085,396 feet of lumber, 904 animals, 497,063 pounds of mail matter, and 27,352,560 dollars or pesos in money. There is included in this transportation 827 tons of freight, 123,190 feet of lumber, 393 animals, and 26,618,900 dollars or pesos in money belonging to the insular government of the Philippines.

### SERVICES FOR OTHER DEPARTMENTS.

During the fiscal year passengers and freight have been transported on army transports for the various Executive Departments of the Government and for the insular government of the Philippine Islands, the value of which transportation at the lowest rates offered and at the public tariff rates is as follows:

| Department. | Value of services at— | | Department. | Value of services at— | |
|---|---|---|---|---|---|
| | Lowest rates offered. | Public tariff rates. | | Lowest rates offered. | Public tariff rates. |
| Navy | $86,602.23 | $139,075.87 | Interior | $273.00 | $273.00 |
| Treasury | 4,654.60 | 9,967.60 | Insular government, Philippines | 156,768.79 | 219,103.64 |
| Post-Office[a] | 139,854.40 | 140,060.40 | | | |
| State | 860.00 | 1,360.00 | | | |
| Agriculture | 758.00 | 1,348.00 | Total | 390,191.02 | 511,713.51 |
| Justice | 425.00 | 525.00 | | | |

[a] Includes carrying 573,563 pounds of mail matter.

### MOVEMENTS AND STATIONS OF TRANSPORTS.

Four vessels are ordinarily employed in this service, viz, *Logan*, *Sheridan*, *Sherman*, and *Thomas*, but the *Sheridan* and *Thomas* being in need of repairs during the year were withdrawn at different times for that purpose and the *Buford* temporarily took their places. The route of transports sailing from San Francisco to Manila is via Honolulu and Guam, and returning via Nagasaki and Honolulu.

The home station of the trans-Pacific vessels is San Francisco, with the exception of the *Dix*, which sails from Seattle; that of the inactive transports on the Atlantic coast is New York, and Manila that of the vessels engaged in the Philippine interisland transport service.

Besides the transports regularly engaged in keeping up the schedule between San Francisco and Manila, carrying passengers, supplies, freight, mail, funds, etc., it has been found advantageous to provide the following extra service:

On July 1, 1904, the *Buford* sailed from San Francisco for Alaska with the Third U. S. Infantry, and returned to Seattle, bringing the Eighth U. S. Infantry, then returned to San Francisco and was put out of commission. On these voyages she carried 113 officers, 1,159 enlisted men, and 49 other passengers, a total of 1,321 passengers, and 2,943 tons measurement of freight.

Later, to provide for the transfer of troops for duty in the Philippines, required the *Buford* to be again put in commission for transportation of troops ordered to sail from Portland, Oreg., this especially because of the request of the managers of the Lewis and Clarke Exposition, and sailed from that port on April 1, 1905, with the Nineteenth U. S. Infantry, arriving in Manila May 5, 1905. There were carried on this voyage 42 officers, 784 enlisted men, and 75 other passengers, a total of 901 passengers, and also 451,000 feet of lumber. At the close of the fiscal year this vessel was still in Manila, scheduled to sail for San Francisco on July 15, 1905.

At the beginning of the fiscal year the *Sumner* and *Kilpatrick* had just completed the transportation of Porto Rican school-teachers and their attendants from Porto Rico to the United States, as authorized by resolution of Congress approved February 12, 1904, which also authorized the transportation of these teachers and attendants back to

Porto Rico at the end of their course of studies at the colleges in the United States. Returning, the teachers were taken on the same vessel from Boston to New York and Philadelphia, and thence to New York, from whence they sailed for Porto Rico on August 16, 1904. The *Kilpatrick* carried on this voyage from the United States to Porto Rico 452 and the *Sumner* 370 passengers. Returning from Porto Rico, the *Kilpatrick* arrived in New York on August 29, 1904, and has since been out of commission.

The *Sumner* arrived in New York from Porto Rico on August 30, 1904, and has since made trips during the fiscal year as follows: On November 14, 1904, she sailed from New York for Colon, Panama, with a Congressional delegation on board, making the outward voyage via Santiago, Cuba, and Kingston, Jamaica, and returning via New Orleans to New York, where she arrived December 12, 1904. On this voyage she carried 39 passengers.

On March 11, 1905, she again sailed from New York, this time for Porto Rico, carrying members of the Committee on Rivers and Harbors of the House of Representatives, and on the return voyage touched at Culebra, St. Thomas; Ponce and Mayaguez, Porto Rico; Santo Domingo; Kingston, Jamaica; Santiago and Habana, Cuba, and thence to New York via New Orleans and Hampton Roads, arriving in New York on April 12, 1905. On this voyage there were transported 64 passengers and 48 tons of freight.

On April 29, 1905, she sailed from New York for Fort Monroe to transport troops to the latter port, to take part in the joint army and navy maneuvers, and for the return of these troops again sailed from New York to Fort Monroe on June 27, 1905; returning, arrived at New York on June 30, 1905. There were transported from New York to Fort Monroe 33 officers, 852 enlisted men, and from Fort Monroe to New York 29 officers and 967 enlisted men, a total of 1,881 passengers.

On these voyages there were transported between the points named 2,352 passengers and 74 tons of freight.

The *McClellan* has remained in New York Harbor out of commission during the entire fiscal year.

The accumulation at San Francisco of a large quantity of supplies requiring to be transported to the Philippines, for which there was not available space on the regular transports sailing between San Francisco and Manila, and the impossibility of securing shipment by commercial lines, made it necessary to put the *Warren* in commission and dispatch her to Manila with a load of army supplies. She sailed from San Francisco for Manila on May 13, 1905, with 3,495 tons of freight, 12 horses, and 26,892 pounds of mail, arriving at Manila on June 10, 1905. Returning she sailed from Manila for San Francisco June 19, 1905, with 49 passengers, 302 tons of freight, and 3,702 pounds of mail, and arrived at San Francisco on July 28, 1905.

The *Burnside*, which is a cable ship, has been in service during the entire year, under immediate direction of the Chief Signal Officer of the Army, laying and repairing cable between Seattle and Alaska and making such repairs as were required to the local cables in home and Alaskan waters. The home port of the ship has been Seattle.

The vessel has rendered no service to the Quartermaster's Department during the entire fiscal year. The cost for running, maintenance, and repairs to her during the fiscal year was $169,908.07—money well expended.

During the fiscal year the *Dix* has had installed on her main deck accommodations for 278 animals, additional to those for 230 which had been installed on her spar deck the previous fiscal year. The cost of these additional stalls, with necessary fittings, was $10,900. Ample provision is made for ventilation, fresh water, exercise, and care of sick animals.

This vessel made three voyages from the United States to the Philippines and return during the fiscal year, transporting 897 animals, 19,561 tons of freight, 2,103,480 feet of lumber, 689 pounds of mail matter; and, including the caretakers for the animals, has transported 185 passengers.

### ACCIDENTS.

The *Buford*, after her arrival at Manila on May 5, 1905, was sent by the division commander to transport the Nineteenth Infantry to the several ports in the Philippines to which the regiment had been assigned, and for distribution of the cargo on board. Early in the morning of May 11, after leaving the port of Malabang, Mindanao, when about 4 miles out, the transport ran aground upon an uncharted reef. After being relieved of the troops on board and a portion of the cargo the vessel floated into deep water on May 14. It was then found that she had sustained considerable damage, and she was sent to Hongkong for repairs, the cost of which amounted to $20,200.29.

November 20, 1904, the *Burnside* left Seattle, Wash., bound far Sitka, Alaska, for the purpose of repairing a break in the Alaskan cable. On the morning of the 21st of November, after entering the Seymour Narrows, the vessel was caught in a strong current and carried broadside onto what is known as Ripple Rock, sustained considerable damage, and was returned to Seattle. The cost to repair the damages sustained through this accident was $31,482.

### REPAIRS AND IMPROVEMENTS.

After their long service it was considered necessary to have extensive repairs and improvements made to the transports *Thomas* and *Sheridan*, including the renewal of furnaces and combustion chambers of the boilers, which had been calked and recalked so often it was deemed unsafe to further repair them. These repairs and a general overhauling of the vessels to render them more commodious and better fitted for the service was commenced prior to the close of the fiscal year, contracts being entered into with the Risdon Iron and Locomotive Works of San Francisco for the work on the *Thomas* at a total cost of $88,704, and with Union Iron Works of San Francisco for the work on the *Sheridan* at a total cost of $57,195.

The repairs and improvements on the *Thomas* have been completed since the close of the fiscal year and she is now in active service. The work on the *Sheridan* is in progress.

It having been decided to place in thorough seagoing condition the transports out of commission in the harbors of San Francisco and New York they were inspected, the repairs necessary to this end determined upon, and have been made at the following cost: For the *Meade*, $12,290; *Crook*, $943.50; *Kilpatrick*, $16,827; *Sumner*, $31,928.50, and *McClellan*, $28,034.

Completion of these repairs places the vessels composing the army transport fleet in a thoroughly efficient condition for any work that may be required of them, and, barring accidents, they will remain so for at least three years with only such minor repairs as are due to ordinary wear and tear and deterioration from action of the elements.

Each of the transports in active use is in charge of a captain of such age and experience as to insure careful administration of its affairs, and every possible means is taken to keep them in good condition and utilize their services to the best advantage. The results have been most gratifying, and the efficiency and value to the Government of the service are amply evidenced by practically all the official reports in which reference thereto is made. Some changes and betterments in service are under consideration, made possible by the present excellent condition of the vessels which will be taken up and submitted with recommendations in another manner.

The transports that sail regularly between San Francisco and Manila, on return to San Francisco from each voyage, are carefully inspected by a board, which decides what repairs are necessary to put the vessel in thorough seagoing condition. Upon this decision specifications are prepared and bids received for the work. The general superintendent then reports to this office by telegraph a synopsis of the work required and the cost, for authority to have it performed. During the fiscal year the average cost for these repairs has been about $3,980 for each round voyage of a transport. By this means the transports are kept in a thorough state of efficiency both as regards seaworthiness and equipment.

The fire-protection systems on the transports are being fitted with a device whereby the pumps are automatically started to work as soon as any hydrant is opened, and a stream of water flows without an instant's delay, ready to be directed against a fire which may start in any part of the vessel. The same device is also applied to the sanitary water system for flushing closets, etc.

Recently an invention for lowering lifeboats has been tested, found successful in principle, and as soon as perfected will be installed on all transports. It consists of a lowering and releasing gear which permits the heaviest lifeboat to be lowered and released in a period of forty seconds by four men, instead of a large detachment from the crew, as is the case with the old hand gear. Appliances in present use, however, are fully abreast of late developments. As an instance of the good work done by transport crews with them, it may be stated that on a recent voyage from Manila a soldier, becoming suddenly insane, jumped overboard, but was picked up in less than eight minutes, notwithstanding the fact that the vessel was going at full speed and the crew of the lifeboat was at dinner when the alarm was sounded.

The care which has been taken in fitting up the *Dix* for transportation of animals, to insure safety upon the long voyage of 8,000 miles from the United States to the Philippines, is well substantiated by the following letter from the insular purchasing agent for the Philippine Islands at Manila, to whom a cargo of mules and burros was sent on that transport, addressed to the General Superintendent, Army Transport Service, San Francisco, viz:

> I am sending you this note to let you know that the animals, including the mules and burros, came through on the *Dix* in fine shape. They seem to have improved on the voyage and were entirely satisfactory.

### SERVICES, EXPENSES, AND EARNINGS.

There have been transported on the army transports during the fiscal year ended June 30, 1905:

| | | |
|---|---|---|
| Passengers | | 32,004 |
| Remains | | 405 |
| Animals | | 904 |
| Freight | tons.. | 79,587 |
| Lumber | feet.. | 3,085,396 |
| Money | | $27,352,560 |
| Mail matter | pounds.. | 573,563 |

The earnings of the transports for the above service, based upon the lowest rates offered for similar service by commercial lines, have been: For passengers, $1,058,374.33; for freight, $647,281.89; total, $1,705,656.22.

At public commercial rates the earnings have been, for passengers, $2,144,100.03; for freight, $948,591.67; total, $3,092,691.70.

No credit has been here taken for the transportation of families of officers, soldiers, and employees or other persons not entitled to public transportation, payable from an appropriation of the United States Government, or persons, animals, supplies, and money carried for the insular government of the Philippines. This gratuitous service during the year, based upon the lowest rates offered for transportation, amounts to: For passengers, $376,688.57; for animals, money, and supplies, $102,246.79; total, $478,935.36.

At public commercial tariff rates the amounts have been, for passengers, $607,548.12; for animals, money, and supplies, $110,201.79; total, $717,749.91.

The following have been the expenditures for running and maintenance of the transports and the expenditures for the conduct of the service at the various ports, viz:

| | | |
|---|---|---|
| Wages of officers and crews | $499,811.05 | |
| Repairs to transports | 127,916.56 | |
| Coal | 310,506.64 | |
| Deck, engine, and stewards' supplies | 433,049.48 | |
| Miscellaneous expenses, including pilotage, towage, laundry, etc | 184,113.86 | |
| Total | | $1,555,397.59 |
| Other expenditures are care and maintenance of transports out of commission at— | | |
| San Francisco | 49,760.13 | |
| New York | 99,673.80 | |
| Total | | 149,433.93 |
| Shore expenses, including proportionate salaries and commutation of officers' quarters, wages of employees, rent of offices, wharves and storehouses at— | | |
| San Francisco | 51,303.95 | |
| Seattle and Tacoma | 7,936.29 | |
| New York | 15,119.30 | |
| Honolulu | 3,904.62 | |
| Nagasaki | 6,154.28 | |
| Manila | 50,867.29 | |
| Total | | 135,285.73 |
| Money value of clothing allowance of the enlisted men employed on the army transports during the fiscal year | | 1,520.45 |
| Value of medical supplies furnished to the army transports during the fiscal year, $14,434.93, 10 per cent of which is chargeable to the crew of the transports | | 1,443.49 |
| Total expenditures on account of the army transport service | | 1,843,081.19 |

| | |
|---|---|
| Included in these expenditures is the cost of operating the army transport *Burnside* in laying and repairing deep-sea cable for the Signal Corps of the Army, and for voyage of the Porto Rican school-teachers from the United States to Porto Rico and Congressional delegations to South America and Porto Rico, set forth in detail in a subsequent page, the total cost of which was | $262,927.07 |
| This service not being performed in the interests of the Quartermaster's Department should be deducted from the expenditures of the army transport service for the fiscal year, thus leaving the expenditure incurred on account of transportation of troops, supplies, etc., and maintenance of transports, both active and inactive, for the conduct of the army transport service proper during the fiscal year | 1,580,154.12 |
| The earnings of the transports during the fiscal year, based upon the lowest rates offered for similar service by commercial lines, were | 1,705,656.22 |
| Which shows a saving to the Government of | 125,502.10 |
| The earnings of the transports during the fiscal year at public commercial tariff rates have been | 3,092,691.70 |
| Deducting the expenditures incurred for maintenance and conduct of the service during the year | 1,580,154.12 |
| This shows the earnings to have exceeded the cost of the service by the sum of | 1,512,537.58 |

NOTE.—No bids were received in response to the invitation for proposals for transportation of passengers and supplies between San Francisco and the island possessions for the current fiscal year; therefore the rates at which credit will be taken for earnings of the army transports for the present fiscal year in the next annual report will be only upon the basis of the public commercial rates.

The following service, in addition to carriage of members of the families of officers and enlisted men, for which no credit was taken, is not properly chargeable against the army-transport service, though the expense of operation is included in its cost in the preceding statement and then deducted to show the actual and proper cost of operating the transports, and leaving this simply a charge against the appropriation for army transportation.

| | |
|---|---|
| Operations of the army transport *Burnside* in laying and repairing deep-sea cables between Seattle, Wash., and ports in Alaska | $169,908.07 |
| For the voyages of the army transports *Kilpatrick* and *Sumner* on which they carried passengers, for which no credit has been taken for expenses incurred on each of the trips, viz: | |
| *Kilpatrick*, voyage to Porto Rico, transporting Porto Rican school-teachers, and return voyage to New York | 26,742.22 |
| *Sumner*, for same voyage | 20,960.45 |
| *Sumner*, voyage to Colon, Panama, and return, with Congressional delegation | 24,214.82 |
| *Sumner*, voyage to Porto Rico, and return, with Committee on Rivers and Harbors, House of Representatives | 21,101.51 |
| A total expenditure for running and maintenance of the three transports for services rendered which was not to the benefit of the Quartermaster's Department of | 262,927.07 |

The advantages of this service to the Government has in each instance been great, though it is obviously impossible to estimate the value to the Government of maintaining the cable between the United States and Alaska; the value of bringing nearly a thousand teachers from Porto Rico to the United States and returning them to their country after a course of instruction at the best institutions in this country; the value of the service performed in bringing those who are responsible for the legislation in contact with the conditions in the West Indies and the Panama Canal. Nor is it possible to estimate the money value to the Government of having the families of officers and employees in the Philippine Islands, where the people of those islands may be enabled to see the value of the home life of the American people; nor to estimate the value to the service, the Government, and the American people of having ready for immediate use transports capable of carrying a considerable army across the seas should an emergency requiring such action actually arise. It can only be said that had such facilities existed at the outbreak of the Spanish-American war they would have resulted in a saving of many millions of dollars, of saving the Government very much just and unjust criticism, and, more important than all else, in saving the lives of large numbers of soldiers both of the Regular and Volunteer service. With the vast extensions of the interests of the American people, both in the Atlantic and Pacific oceans and to the south in the Isthmus of Panama, it would seem but a wise precaution to maintain the means of making our Army effective wherever conditions may arise that would require its activity.

### IN THE PHILIPPINES.

During the year there have been in service in the Philippine Islands five owned transport vessels for the transportation of passengers and supplies to interisland ports, viz:

The *Ingalls*, used as a dispatch boat by the division commander, now out of commission; the *Liscum*, used as a cable ship; the refrigerating ship *Seward*, and the *Sacramento* and *Wright*, used as passenger and freight transports. There were transported on the owned vessels between Manila and other ports 11,037 passengers (officers and enlisted men of the Army, of the Navy, and authorized employees), the value of which at commercial rates is $237,385.40; 25 remains, 26 animals, 35,619 tons freight, 308,210 feet lumber, $1,420,688.93 in money, the value of which at commercial rates is $324,392.81; total earnings of the five transports, $561,778.21.

In addition to the above service there were transported 944 passengers, 738 tons of freight, 170,380 pounds of mail matter, and $96,445.36 in money, for which no credit was taken.

The expenditures have been as follows: Pay of officers and crews, $158,473.01; repairs, $78,450.22; coal, $91,346.12; deck, engine, and stewards' supplies, $73,953.81; miscellaneous expenses, $31,150.39; total, $433,373.55. The earnings of the vessels at public tariff rates in excess of expenditures is therefore $128,404.66.

There have also been employed under charter for various periods during the fiscal year 16 steamships for the transportation of passengers and freight between interisland ports which have carried 18,490 passengers (officers and enlisted men of the Army, of the Navy, and authorized employees), the value of which at commercial tariff rates is $286,709.50; 80 remains, 658 animals, 90,258 tons freight, 3,942,395 feet of lumber, and $1,068,938.84 in money, the value of which at public tariff rates is $630,687.96; total earnings, $917,397.46.

There were also transported, for which no credit is taken, 4,013 passengers, 1,936 tons of freight, and 254,775 pounds mail matter.

The expenses incurred for service of these vessels have been: For charter, $349,866; for pay of commissioned officers, civilians, and enlisted men, $24,479.81; for repairs, $2,104.63; for coal, $77,272.98; deck, engine, and stewards' supplies, $3,175.85; miscellaneous expenses, $8,615.84; total cost of operation, $465,515.11.

The net earnings of the vessels in excess of the cost for their charter and running expenses is $451,882.35. The shore expenses in the Philippines chargeable to the interisland transport service is reported at $429,900.24.

*Recapitulation.*—The earnings of the interisland transports during the year were: Owned vessels, $561,778.21; chartered vessels, $917,397.46; total, $1,479,175.67.

The expenditures for operations were: Owned vessels, $433,373.55; chartered vessels, $465,515.11; shore expenses, $429,900.24; total, $1,318,788.90. Leaving earnings in excess of expenditures, $150,386.77.

Had the foregoing services been rendered by commercial lines the amount stated as shore expenses, $429,900.24, might possibly have been reduced by the sum of $90,187.46. Had the work been done by commercial lines it would have been necessary to maintain a force of officers, clerks, and employees for the conduct of the business at the various ports in the Philippines, and to provide labor, lighterage, etc., for the handling and care of the Government stores transported.

## NATIONAL CEMETERIES.

In the 83 national cemeteries the interments to June 30, 1905, were: Known 199,690, unknown 152,009, a total of 315,699, being an increase of 1,847 during the fiscal year, including the remains of officers and enlisted men returned from abroad. Removals were made of the remains of 41 officers and enlisted men from abandoned post cemeteries and other places within the United States to permanent post or national cemeteries.

These cemeteries are kept in excellent condition, but it must be noted that the superintendents are generally becoming too old to efficiently perform their duties. They are appointed from applicants having service in the civil war, who were wounded or disabled in the line of duty, but not to such extent as to incapacitate them from this work, and many of them were not exactly young men at the beginning of their war service.

*Headstones.*—Fifteen thousand five hundred and seventeen white marble headstones were furnished to mark the graves of known Union soldiers, sailors, and marines in national, post, city, and village cemeteries, and 1,108 similar headstones to mark the graves of civilians in post cemeteries.

Two thousand five hundred dollars was appropriated in the sundry civil act of 1900 for the erection of headstones at the graves of approximately 260 Confederate soldiers buried in Arlington National Cemetery. The headstones furnished are of a design similar to those placed at the graves of Union soldiers, except that the tops are pointed instead of rounded and the service is designated by the letters "C. S. A." There are approximately 9,300 Confederates buried in the various national cemeteries, of which some 5,000 lie in graves marked only by a stake or headboard. It would require only about $25,000 to furnish and set appropriate headstones for these graves, a last service for these men which this Department would gladly perform if Congress will give the funds and authority.

*Antietam battlefield.*—Under the act of Congress (sundry civil) approved April 27, 1904, making appropriations "for repairs and preservation of the monuments, tablets, observation tower, roads, and fences, etc., within the limits of the Antietam battlefield, near Sharpsburg, Maryland," two stone bridges were built to replace the wooden bridges no longer considered safe. The roads, fences, etc., received such necessary repairs as could be made with the funds available.

*Roadways.*—The work of repairing and improving the Government roadway from Springfield, Mo., to the national cemetery near that city was completed during the fiscal year at a total expenditure of $23,633.13, including the sum of $13,026.50 expended during the previous year.

Necessary repairs to roadways to national cemeteries were made at Alexandria, La., Alexandria, Va., Antietam, Md., Barrancas, Fla., Chalmette, La., Florence, S. C., Fredericksburg, Va., Mound City, Ill., Natchez, Miss., Newbern, N. C., Port Hudson, La., Richmond, Va., Springfield, Mo., and Staunton, Va.; amount expended, $9,569.26.

*Massacre Hill Monument.*—Under the acts of Congress approved April 29, 1902, and February 18, 1904, appropriating the sum of $1,200 "for the purpose of erecting a suitable monument of rough masonry, and historical tablet, to mark the site of the Fort Phil Kearney Massacre, December 21, 1866," the monument was completed during the fiscal year, at an expenditure of $1,195. The lot was inclosed with a substantial fence and the monument and grounds placed under the charge of the post quartermaster at Fort Mackenzie, Wyo. The site of the monument comprises an area of three-fourths of an acre, situated in Sheridan County, Wyo., and was ceded to the United States by act of the legislature of the State of Wyoming, approved February 19, 1903.

*Disinterring corps.*—This corps is still maintained in the Philippines and disinters and prepares for shipment home the remains of officers and men of the Army and Navy and civilian employees who die there. The two-year limit within which, for sanitary reasons, bodies of those dying from cholera were prohibited being disinterred having expired, the corps was largely employed in removing remains of victims of that disease, and practically all such have been returned for burial in the United States.

### BURIAL OF DISTINGUISHED CITIZENS IN ARLINGTON.

The propriety of extending the privilege of burial in Arlington National Cemetery to deceased civilians who have won distinction in public life has been frequently discussed and continues to be considered. Not only do I fail to see any vital objection to this being done, but consider it to be fitting and proper that it should be. Men in civil life often render their country services as well worthy distinguished recognition after death as those in the military service, and for such Arlington would seem a most fitting burial place. There is ample area in the cemetery for this purpose, under proper restrictions, and it is already the place where the country's illustrious dead are, in the largest number, gathered in their last sleep.

At all the national cemeteries necessary repairs were made to the inclosing walls, lodges, outbuildings, water supply, and drainage, and the grounds, walks, and drives kept in good order.

## CLAIMS.

There remained on hand at the beginning of the fiscal year, awaiting action, 226 claims and accounts, amounting to $61,081.51, and there were received during the year 837 claims and accounts, amounting to $31,885.86, making a total of 1,063 claims and accounts, amounting to $92,967.37. During the fiscal year 873 claims and accounts were passed upon and settled or properly referred to other Departments, the amount involved being $53,527.79. There remained on hand June 30, 1905, 190 claims and accounts, amounting to $39,439.58.

*Confederate horse claims.*—In all, Congress has appropriated $325,000 for the purpose of paying claims of artillery and cavalry officers and private soldiers of the Confederate army for horses, side arms, and baggage alleged to have been taken from them by Federal troops at and after the surrender at Appomattox, acting under orders, in violation of the terms of surrender. The act of April 27, 1904, extended the time for filing these claims two years from that date.

Up to and including June 30, 1905, 2,613 of these claims were received, of which 1,671, amounting to $222,090.70, have been authorized paid, leaving an available balance of $102,909.30 for payment of remaining claims. The average amount allowed for each claim was $132.91; therefore the available balance will pay, approximately, 774 of the 787 claims pending in this office at the close of the fiscal year or that may hereafter be filed.

*Insular and Cuban claims.*—Of these there remained on hand June 30, 1905, 243 claims disallowed and 45 claims suspended awaiting further investigation, involving $2,906,162.15. All of these are claims for unliquidated damages, which can only be settled through Congress or from funds specially appropriated for their payment.

*Under act of July 4, 1864.*—Eighty-one claims under this act remained not acted upon at the close of the fiscal year, the amount involved being $86,125.92, action having been suspended awaiting additional evidence. The papers relating to 12 claims, amounting to $32,878.20, investigated and disallowed, were transmitted to the Court of Claims and Department of Justice as evidence in cases appealed to the Court of Claims under the provisions of the act of March 3, 1883, known as the Bowman law.

## ACCOUNTS AND RETURNS.

There were in this Office July 1, 1904, for examination and transmission to the Auditor 684 accounts of disbursing quartermasters, and during the fiscal year 7,265 accounts were received, a total of 7,949. Of these there were examined and sent to the Auditor 7,808, leaving on hand July 1, 1905, but 141.

Of property returns there were 80 on hand awaiting examination July 1, 1904, and there were received during the year from quartermasters 2,671, a total of 2,751, of which 2,694 were examined, leaving the number on hand June 30, 1905, to be examined 57. There were also received and examined during the fiscal year 47 annual returns of militia officers. In connection with the settlement of these returns 8,020 letters were written, as against 10,834 for the business of the preceding fiscal year.

It will be noted that there was a marked reduction in the number of both money and property returns remaining on hand for examination at the close of the fiscal year, from the number so remaining at the close of the fiscal year 1904. This gratifying result is due to the improved manner of rendering these returns and of handling them in this office, inaugurated during the past two years, the value of which is now being demonstrated and will become more and more apparent as the old and obsolete systems are replaced by new and modern ones.

### PERSONNEL.

The personnel of the Quartermaster's Department comprises 96 officers, divided according to rank as follows: One brigadier-general, 6 colonels, 9 lieutenant-colonels, 20 majors, 60 captains, 200 post quartermaster sergeants, and practically an innumerable civilian force distributed throughout the United States and the insular possessions.

During the fiscal year 4 officers retired, 1 died, the four-year detail of 2 expired, and 1 was relieved before expiration of detail, making 8 vacancies, which were filled by details from the line, as provided by law.

In addition to the above regular force of the Department there were on June 30, 1905, 21 officers of the line on duty in the Department, by detail as acting quartermasters, in charge of construction at various posts and 10 in charge of transports and on other duties. Even with this extra detail of acting quartermasters the Department is hampered by lack of a sufficient number of properly qualified officers to carry on its operations. Already well-grounded complaint is made from the line that by detail for various duties organizations are depleted of officers to the point of impairing efficiency, so that no relief can be expected through obtaining further details, while the necessities of the Department in works of construction, manufacture, inspection, and numberless other directions, demanding the services of officers of ability, judgment, and experience, go on increasing.

In this connection I desire to commend the zeal and intelligence with which, with very rare exceptions, the officers of this department and those detailed to its service, have performed their duties. The excellence of their work, and their hearty cooperation in carrying into effect the plans of this Office, reflect credit on the service and are to me, personally, very gratifying.

### PERMANENT APPOINTMENTS AND DETAILS FROM THE LINE.

In connection with the foregoing I renew my recommendation of last year that 30 of the 60 captains of the corps be permanently appointed to the Department or continuously detailed, and the remaining 30 detailed as now provided, and further recommend that the strength of the corps be increased by 30 captains, 15 of whom shall be assigned to each class, all officers above the rank of captain to be subject to continuous detail. Vacancies in the first class of captaincies should be filled by selection from officers serving, or who have served, as detailed captains in the corps, or as regimental quartermasters. In the second class of captaincies, in addition to the detail of captains of the line, the law should authorize the detail of first lieutenants of the line, to have the rank and pay of captains mounted, while serving as quartermasters by detail. As I stated in my last annual report, and would gladly emphasize if possible, the duties of a quartermaster are of such a nature and so great a scope as to constitute a profession in themselves. In fact, in private life there are single branches of the duties devolving upon this department which men take up and follow as their profession and to which they devote the work of their lives, as, for instance, construction work, transportation business, the manufacture of clothing and of shoes, and a number of other examples might be cited. Even after proper appointments have been made a quartermaster's duties can only be learned by close application and long experience; therefore, the longer an officer serves in the department the more efficient he becomes and, consequently, the more valuable to the service in general. The necessity of efficient service in this Department and of affording it the fullest possible scope to secure and retain the talent most fitted for its conduct seems to me too obvious to require argument, and it is not considered that the present system is affording that opportunity.

This is, in commercial life, an age of specialization, and the detail system, as applied to this department, needs these changes to make it conform to modern business methods, with which it must come in touch at all points.

### BATTALION QUARTERMASTERS.

Based, no doubt, upon the provision in the act of February 2, 1901, that "battalion adjutants shall receive one thousand eight hundred dollars per annum and the allowances of first lieutenants, mounted; battalion quartermasters and commissaries shall receive one thousand six hundred dollars per annum and the allowances of second lieutenants, mounted," the custom prevails of selecting second lieutenants for quartermasters at posts where less than a regiment is stationed and first lieutenants for adjutants. This is considered a mistaken policy, as the adjutant acts always under the eye of the commanding officer, simply carrying out his directions, and has no money or property responsibility, while the quartermaster has many duties of a semi-independent nature, frequently disburses considerable amounts of public funds, and is accountable for large quantities of property and supplies. The latter is altogether the more important and responsible position and should in all cases be filled by the officer of the most experience and best judgment available. It would be better if captains were generally detailed for these positions, but at the very least the present arrangement should be reversed. Without wishing to in the slightest reflect unfavorably on the efforts of the young officers performing quartermaster duties, it is realized that better results could be had if more experienced officers were employed as battalion quartermasters, and much clerical labor of calling for corrections of money accounts, property returns, and reports, and of issuing instructions saved. It is experience the young officers lack, and experience is the most important item in fitting a quartermaster for his duties.

### BONDS OF DISBURSING OFFICERS.

Officers of the Quartermaster's, Commissary, and Pay departments, and certain officers of the Medical Department are required by section 1191, Revised Statutes, before entering upon their duties, to give good and sufficient bonds to the United States in such sums as the Secretary of War may direct, faithfully to account for all public moneys and property which they may receive. It has been judicially decided that "this section does not apply to all commissioned officers of the

Army who may be required to act as disbursing officers, but to such only as are appointed disbursing officers and who are required as such to give bonds." This leaves officers of certain other branches of the service free to act as disbursing officers and handle large sums of Government money and have charge of great quantities of supplies and property, some of which is very valuable, without being required to be at the expense and inconvenience of furnishing the Government security as is exacted from those specified in the law, a discrimination and unfairness that to be apparent needs only to have attention called to it. In accordance with this decision, it has been held that officers detailed as acting quartermasters are not, under the law, required to give bonds, and none have been required of them. It is also understood that bonds are not required of other officers exempt by this statute and decision from furnishing them, no matter what sums of public funds or quantities of public property they may handle. There are now in the service of this department 24 officers of the line detailed as acting quartermasters in charge of construction at various posts, under instructions of the Quartermaster-General, 5 detailed as acting quartermasters in the Army transport service under orders of the Quartermaster-General, and 5 detailed on other quartermaster duties, from none of whom have bonds been required. The officers acting as constructing quartermasters are in charge of very important work and disburse considerable sums of money, in many cases greater than do the bonded officers of the department. The transport quartermasters also disburse more or less funds and are in charge of a great deal of exceedingly valuable property.

It has been held by the Comptroller of the Treasury that officers of the line detailed for service in the Department for four years, under the provisions of the act of February 2, 1901, are officers of the Quartermaster's Department within the meaning of the section above referred to and are required to give the bonds therein provided.

A striking example of the paradoxical status created by the provisions of this statute, and decisions thereunder, was recently developed by the detail to the Department of a line officer who had been an acting quartermaster in charge of construction at an important southwestern station. He had, in a very satisfactory manner, carried on the tasks and disbursed the funds intrusted to him while an acting quartermaster, without bonds, and the work was nearing completion while his disbursements were constantly diminishing, and there was not the faintest shadow of supposition that he would not continue to do so for the future. Nevertheless, upon his detail to the Department, he was required to close his accounts as acting quartermaster, deposit the funds in his possession, furnish a bond and open a new account, his duties in the meantime not having changed in any respect, before he could be supplied with funds to make payments. The absurdity of the condition is obvious, especially when it is remembered that there are officers of nearly all the other departments disbursing annually thousands, and in some instances even hundreds of thousands, of dollars of public money without any requirement of law that they should furnish bonds. It is my opinion that this glaring inequality of requirement should be abolished and all disbursing officers of the Army placed upon an equality in the matter of furnishing security for their official integrity, and I therefore recommend the repeal of this statute. It is an expensive and, standing now as a discrimination, a humiliating exaction from the officers to whom it applies. For this Department, I feel safe in asserting that the requirement is rendered redundant through the personal and professional probity of its officers.

## POST QUARTERMASTER-SERGEANTS.

The recommendation that the number of post quartermaster-sergeants be increased by 50, the additional number to be designated as post quartermaster-sergeants of the first class, and have the same rank, pay and allowances as hospital sergeants of the first class is renewed. There are at present about 150 posts and stations in the United States at every one of which one, and at the more important two, and in some cases three post quartermaster-sergeants should be stationed, if the force were sufficient to allow it. There are also something over 100 posts and stations in the Philippines where it has been found possible to send but 35 of these sergeants for duty, but the services of double that number or more could be utilized with advantage. The increase pay for 50 of the sergeants is advocated because the duties on which that many are engaged warrant it. It will also give opportunity to reward those who now or may hereafter deserve it, and the possibility of promotion will have a good effect upon the subordinate sergeants. The additional expense of the increased number of sergeants desired would be more apparent than real, as they would largely replace civilian employees, now costing the Government more than they would.

## GENERAL SERVICE CORPS.

I have long realized that, could it have at command an enlisted general service corps of sufficient numerical strength, this Department could, in many respects, more efficiently and economically administer its affairs and maintain better discipline than is possible with civilian employees. The men of such a corps would occupy a certain and determined position in the Army; be without question subject to its laws and regulations, both as to their duties and their privileges; and the matter of selection, duties, quarters and rations furnished, separation from the service, etc., would be placed entirely upon a military basis. Nor is it believed any serious difficulty would be encountered in selecting and enlisting competent and reliable men of the trades and callings required to form such a corps. It is well known that there are already frequently to be found among the enlisted men of the Army skilled mechanics and artisans, whose abilities are largely utilized and for which considerable sums are annually allowed them as extra-duty pay. By transferring such men, the nucleus of a most efficient corps could be formed, which there is little doubt could be so organized, developed, and distributed as to in time remove the necessity for any considerable number of civilian employees, under normal conditions. As an indication of what might be done in this respect the post quartermaster-sergeants are an instructive example. No better, more reliable, or competent body of men of like rank can be found, and their duties and responsibilities are by no means light. Recommendation for the establishment of such a corps, with outline for its organization, was made to the Secretary of War in a communication dated February 16, 1904; and in my annual report for 1904 it was renewed and the advantages of such an organization briefly discussed. Attention is respectfully invited to that discussion and also to the timely and pertinent remarks of Brig. Gen. J. M. Lee, commanding the Department of Texas, upon the same subject in his annual report for the fiscal year 1905.

In times of actual service there are certain civilian employees as, notably, teamsters and packers, whose duties may and frequently do, take them into the same positions of danger as troops, and to place all such on the same footing as enlisted men would be only fairness to them in addition to the advantages accruing to the service.

The establishment of such a corps for the Department would, I am convinced, result in an actual saving of funds. While the pay of its members would have to be, for nearly all grades, higher than privates receive, the advantages of quarters, allowances, and prospective retirement would allow marked reductions from the salaries now paid civilians. There would also be eliminated much of the correspondence now necessary in making selections, transfers, separations, reporting the status, etc., of civilian employees in the classified service, effecting a saving in clerical work at posts and stations and in this Office.

### GENERAL ARMY SERVICE DETACHMENT, WEST POINT.

This detachment was established by act of June 20, 1890 (26 Stat. L., 167), directing the muster out of the artillery detachment stationed there and reenlistment of its members as army-service men in the Quartermaster's Department, and is in the nature of the corps recommended above for the entire service. Experience with this organization demonstrates the practicability of the system, and the members have performed their duties efficiently and faithfully. Under the provisions of the law establishing this detachment and a decision of the Comptroller (IV Comp. Dec., 353) most of these men receive extra-duty pay from appropriations of the Military Academy or the Quartermaster's Department, amounting last fiscal year to over $19,000 in quartermaster funds, and for a time funds of this Department were being used for this purpose on the strength of this statute and decision, without obtaining authority, as in other cases where extra duty is paid. This was faulty administration, and I directed that the practice be discontinued and authority be hereafter obtained for extra-duty payments from appropriations for this department. The allotments for the first half of the fiscal year 1906 aggregate $9,702.30. It is believed that this system should be changed. Extra-duty pay is allowed enlisted men for performing other than the military duties for which they joined the service. The men of this detachment are employed on the service for which they entered it, and are not subject to military duty, to be transferred to other posts or ordered to serve in the field. Therefore, in my opinion, they ought not to receive extra-duty pay. Instead of that, their ratings should be revised and the pay fixed at a proper amount for the service of each class, and extra-duty pay for members of this organization abolished. The cost to the Government would be practically the same, but this would correct a wrong method and dispense with considerable paper work incident to extra-duty payments in addition to the regular pay roll of the detachment.

## CLERICAL FORCE.

In my report of last year I stated that the 191 employees authorized for this Office were insufficient to properly conduct its business, and while important changes in working methods of this Office and the Department at large have greatly improved conditions, and the general efficiency of the force has been raised through a careful readjustment of duties and discriminating selection of employees to fill vacancies, those remarks are still pertinent and the force is still entirely insufficient to handle the daily increasing volume of work of the Office in a proper and satisfactory manner. In some ways this lack of sufficient force works as a hardship on the more responsible clerks, as it has been found necessary to curtail annual leaves and exact considerable overtime, for which there is no extra compensation, in order to bring and keep the work up to date.

In this connection it may be noted that one of the most burdensome of the increases of clerical labor has been in the matter of the administration of the classified civil service. This Department has in its various branches an innumerable force of classified employees, and all matters relating to their selection, separation, and transfer, as well as numerous minor items, must be handled through or by this Office. This work requires the time, almost exclusively, of the personnel branch, where a force of some 15 clerks is employed at an approximate cost of $20,000 per year. During the past fiscal year the volume of correspondence concerning such matters has increased about 50 per cent, and it may yet become necessary to increase the force of clerks on this class of work to comply with the rules and exactions of this service.

There have been a number of separations from this Department during the fiscal year by transfers to other bureaus and resignations to accept positions in private life. It is probably needless to repeat my views concerning transfers, which were fully set forth in my last annual report, and have undergone no change. The resignations to enter commercial life have of course been from among the most efficient clerks, who have been offered better salaries or positions of more promise than could be paid or offered by the Department. While the loss of such men is unfortunate there is no way to prevent it or grounds for objection, although it would indicate that salaries need revision and an increase that will offer more inducements to capable and energetic young men to remain in the service, where the Government will reap the advantages of their ability and experience. A good man's services are certainly worth as much to the Government as to a commercial concern, and it ought to be possible to pay such enough to retain them; there is no trouble about the indifferently qualified ones remaining in the service.

Under Rule VII of the Civil Service Commission employees already in the service of a Department may take examinations, secure ratings on the Commission's eligible list, and, if certified for a vacancy in another Department, may accept the same after a period of thirty days without consent of the Department in which employed. It may thus occur that the very training which a clerk secures in an office where employed is the means of securing him a position in another, regardless of the desire of the former to retain him, as has occurred in this Office. I do not believe it is good policy to permit this, especially where the examination and certification are for the same class of work in which the employee is at the time engaged and the new certification is not to a higher class. Where a Department has trained an employee to efficiency, and his knowledge of its work and experience in its methods has become developed, that Department should have first call for his services. Injustice will seldom be done to worthy persons, as bureau chiefs would rarely, if ever, hinder a transfer where in the way of advancement of the party seeking it.

I do not know that I can add to my remarks of a year ago concerning the necessity of some plan for retirement of superannuated employees, although I would emphasize the need of it, if possible. I am aware that the question is receiving attention from Congress, the Civil Service Commission, an association of clerks, and many others interested, and have no doubt a satisfactory solution will be reached in the end. But the need is pressing, and if some action is not taken soon this Department must eventually be left to a choice between doing individual injustice to some of its old and loyal employees, through reductions in grade or discharge, or to the younger and more vigorous clerks by compelling them to do work for which others are receiving pay, and to the administration of its affairs through paying men for services they can no longer render. Of course, when such a condition becomes no longer bearable it must be the old clerks who will suffer. Already it has been found imperative, in the interests of good administration, to make some reductions in grade of employees whose abilities were impaired through age, and many others must soon follow unless relief is found through legislation. The higher grades of clerkships are almost entirely filled by men who have been for years in the service and have long passed the age at which men are most efficient in the performance of such duties. With few exceptions these gained the grades they now hold through ability and merit, and for years returned for the salaries received full value or better in services rendered. Having now reached the point in life where they are no longer physically able to do this the burden of the work passes on to the younger clerks, with only the remote possibility of also securing the pay therefor through the death, reduction, or discharge of the older men. No man, I believe, with the slighest appreciation of the loyalty of the long service of these old, tried, and faithful employees will urge that they should be discharged, and a reduction in salary is so disheartening to them as to render nugatory their services after such action. No matter how kindly the necessity is explained to them reduction is a severe blow, with a lasting sting keenly felt by the worthy ones who have reached the period where, through the limitations of nature, retirement ought to come.

If they are retained in the grades attained by merit in the period when they could and did do all or more than their duty, the effect on the younger clerks who then do the work is depressing in the extreme. Some provision for retiring the old clerks ought to be made. More good effects on administration would probably come through provision for retirement than any other one action that could now be taken, and its effect would doubtless prove as beneficial as did the establishment of the merit system.

I am not at this time prepared to recommend any particular plan, and my views on the question are more fully expressed on page 34 of my annual report for 1904, to which attention is invited.

## IMPROVEMENT IN METHODS.

Especial attention has been given throughout the year to improving and modernizing the business methods of this Office and of the Department at large, and gratifying progress in this direction has been made. It is not possible, in the limited space of this report, to explain in detail all changes made and only actual experience could furnish an adequate conception of their advantages. Broadly speaking, it may be said that but for such changes this Office must have utterly failed to keep its work up to date with the clerical force at its command, and the volume of business daily increasing.

The old system of correspondence in vogue in this Office which required a communication to be typewritten, then transcribed on card slips, and a press copy made for file has been replaced by one by which all necessary copies are, by means of carbon sheets, provided at a single operation of a typewriting machine. This system, together with the enlarged use of the services of stenographers, has reduced the average time required for communications to pass through the Office from about four days to one day.

In authorizing expenditures there has been introduced a system of "authorization cards," which, with auxiliary reports of cost and of savings, has enabled much better trace to be kept of the state of appropriations and insures their more intelligent use. While under the old system careful account was kept of balances of appropriations remaining in the Treasury, the office was deficient in information as to the unallotted balances of appropriations available for use. By present arrangements it is possible to know not only the balances in the Treasury which may be drawn on for remittances, but as well the balances in the appropriations unallotted and available. It can readily be seen that this is important, for while there might be considerable sums remaining in the Treasury to the credit of an appropriation the larger part or the whole might be practically spent through allotments to meet purchases, future payments on contracts made, etc.

The four or five copies of all authorities required are now made at a single operation by the use of carbon sheets and billing machines, instead of separately, as formerly, a considerable saving in clerical labor.

To utilize the limited space so as to accommodate the increasing volume of correspondence and records, sliding cabinets were introduced, materially adding to the filing room, as well as reducing the time required for handling papers. The substitution of carbon for press copies also permits a more compact filing, besides furnishing more legible records.

In the examination of money accounts of disbursing quartermasters this Office for many years labored under a constant tension, due to the requirement that they be transmitted to the Auditor for the War Department within sixty days after their receipt here, and the fact that the limited force available for such work had not been increased to conform to the enlargement of the Army. It was thought some means might be found to remedy this condition, and investigation to that end showed that much of the work was being duplicated in the Auditor's Office. This fault was immediately remedied, and the examination now made in this Office is, as provided by law, administrative only. With this change, and the elimination of certain records and correspondence rendered redundant through it, it was found possible to utilize the services of some of the clerks formerly employed in this unprofitable work at other places, where urgently needed, and yet to increase the average of accounts examined about 100 per month. This has relieved the congestion, and accounts are now being examined and forwarded to the Auditor within a few days after receipt.

### NEW FORMS.

*Returns of quartermaster property.*—Under the old system a constant confusion arising through classification of various articles of quartermaster property not only increased the work of preparing returns but materially hampered the examiners when the same were reviewed in this Office. Much of the work was duplicated in needless abstracts, all of which had to be made out before the return could be closed and property accountability determined. A system of individual slips for each article has been adopted, and these being filed alphabetically all abstracts are abolished and items entered as transactions take place, which permits an immediate determination of stock and the closing and rendering of a return with the least possible work.

*Annual inspection report of buildings.*—This report combined a description of the buildings at each post or station, their condition, the amounts expended during the year on repairs, and estimates for repairs for the succeeding year. The space allotted for the purpose was insufficient to thoroughly describe the buildings and appurtenances, and year after year the same data were uselessly and laboriously copied from the preceding year's report. There has been substituted for this cumbersome and inconvenient form an historical record for each public building, which will be complete as to all details of the buildings at each post, and copies will be preserved in this Office, in the office of the chief quartermaster of each department for the posts in the department, and at each post. It will be amended from time to time so as to show the latest information concerning the buildings.

The data required in connection with repairs are now supplied on a separate annual estimate, which also furnishes report of expenditures authorized and made for the previous year. Not only does this system furnish a more convenient blank to handle, but avoids needless repetition of work.

*Report of persons and articles hired and report of extra-duty men.*—To avoid duplications of payments and for the investigation of claims, it is necessary that a record be kept in this Office of all services engaged by the various quartermasters, against which check is made as vouchers are inspected. The system heretofore in vogue required a monthly report of all employees engaged or services hired, which reports, for continuous service, were duplicated month after month. Not only did this stock the file rooms with tons of records, but the clerical work required throughout the service in the rendition of these reports was enormous. Embodying all the requirements, a system has been introduced by which a report is made when the service is first engaged and another when it is terminated. The necessary checks on duplicate and original copies are made as vouchers are paid and inspected in this Office, respectively. No material reduction in work is accomplished for services beginning and terminating within a month, but for all permanent employees and continuous service the reduction is very material.

These are only outlines of the more important improvements in business methods for this Office and the Department at large, there being many others of minor importance which have largely reduced clerical labor and expedited business. Still others are under consideration, and it is believed that the methods of this Office approach as nearly the flexibility and expeditiousness of those of the best regulated commercial concerns in the modern business world as is possible in conformity with existing laws and regulations and decisions of the Treasury officials, which have, to this Department, the force of law.

Respectfully submitted.

C. F. HUMPHREY,
*Quartermaster-General, U. S. Army.*

The SECRETARY OF WAR.

# REPORT OF THE COMMISSARY-GENERAL.

# REPORT OF THE COMMISSARY-GENERAL.

WAR DEPARTMENT,
OFFICE OF THE COMMISSARY-GENERAL,
*Washington, D. C., September 30, 1905.*

SIR: I have the honor to submit the following report of the operations of the Subsistence Department for the fiscal year ending June 30, 1905:

### RESOURCES, EXPENDITURES, AND BALANCES.

The following statement exhibits the aggregate fiscal resources and expenditures of the Department and the balances at the close of the fiscal year 1905:

## RESOURCES.

| | Subsistence of West Point cadets, inaugural ceremony. | Subsistence of the Army, certified claims. | Encampment and maneuvers organized militia, 1905. | Subsistence of the Army, 1902 and prior years. | Subsistence of the Army, 1903. | Subsistence of the Army, 1904. | Subsistence of the Army, 1905. |
|---|---|---|---|---|---|---|---|
| **Amounts in Treasury to credit of appropriations of the Subsistence Department, June 30, 1904** | | | | | $5,928,872.06 | $506,546.81 | |
| Amounts which were reported in last annual report as being to credit of officers of Subsistence Department with the Treasurer, assistant treasurers, designated depositaries, and in their personal possession on June 30, 1904 | | | | $4,308.64 | 2,779.51 | 778,270.58 | |
| Amount appropriated for subsistence of the Army for fiscal year ending June 30, 1905 (act of Apr. 23, 1904) | | | | | | | $7,000,000.00 |
| Amount of war appropriation warrant No. 2 (in part): | | | | | | | |
| Act Apr. 23, 1904 | | | $100,000.00 | | | | |
| Act approved Mar. 2, 1905 | $1,080.00 | | | | | | |
| Deficiency act approved Mar. 3, 1905 | | $2,495.19 | | | | | |
| Amounts collected from various sources and refunded to appropriations of Subsistence Department, on the books of the Treasury during the fiscal year 1905 | | | | 5,725.70 | 2,540.70 | 44,265.84 | 83,264.24 |
| Amounts charged against officers on account of funds alleged to have been lost by theft, etc.: | | | | | | | |
| Officers still in service | | | | 2,469.33 | 680.85 | 460.14 | |
| Officers out of service | | | | | 5,700.15 | | |
| Amounts received by officers from sales of stores during fiscal year 1905 and taken up for immediate disbursement | | | | 48.50 | 104.51 | 5,581.51 | 2,501,437.44 |
| Amounts taken up by officers on account of refundments and reclamations for stores lost, damaged, etc., to correct errors in their accounts during above period | | | | 176.14 | 32.04 | 728.54 | 5,654.74 |
| Amounts taken up by officers as gains | | | | | | .63 | 3,635.20 |
| Total resources | 1,080.00 | 2,495.19 | 100,000.00 | 12,728.31 | 5,940,709.82 | 1,335,854.05 | 9,593,991.62 |

## EXPENDITURES.

| | Subsistence of West Point cadets, inaugural ceremony. | Subsistence of the Army, certified claims. | Encampment and maneuvers organized militia, 1905. | Subsistence of the Army, 1902 and prior years. | Subsistence of the Army, 1903. | Subsistence of the Army, 1904. | Subsistence of the Army, 1905. |
|---|---|---|---|---|---|---|---|
| **Amounts expended on** the books of the Treasury from the appropriations of the **Subsistence Department** during the fiscal year 1905 | | $2,495.19 | $5,228.27 | | $1,201.56 | $1,679.55 | $397.87 |
| **Amounts disbursed by** officers of Subsistence Department during fiscal year 1905 | $886.00 | | 62,119.16 | | 1,331.33 | 86,075.59 | 8,128,188.69 |
| **Amounts dropped by officers to correct errors in their accounts during fiscal year 1905** | | | | | | 100.00 | 167.68 |
| **Amount of balances unaccounted for by officers whose accounts are in process of settlement** | | | | $2,194.33 | | | |
| **Amounts charged against officers on account of funds alleged to have been stolen, etc., now dropped from this statement as satisfied** | | | | 1,180.97 | 680.85 | 411.25 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Amount transferred to Quartermaster's Department, by order of Secretary of War, dated Jan. 21, 1905 | | | 28,903.18 | | | | |
| Amounts carried to the surplus fund on June 30, 1905 (act June 20, 1874) | | | | 9,353.01 | 5,930,410.23 | | |
| Total expenditures | 886.00 | 2,495.19 | 96,250.61 | 12,728.31 | 5,933,623.97 | 88,266.39 | 8,128,754.24 |

## BALANCES.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Amounts in Treasury to credit of appropriations of Subsistence Department June 30, 1905 | $194.00 | | | | | $1,240,277.32 | $716,866.85 |
| Amounts to credit of officers of the Subsistence Department with the Treasurer, assistant treasurers, designated depositaries, and in their personal possession per the latest accounts received to June 30, 1905 | | | $3,749.39 | | $1,385.70 | 4,301.82 | 748,254.83 |
| Amounts charged against officers on account of funds alleged to have been lost by theft, etc.; officers out of service | | | | | 5,700.15 | 3,008.52 | |
| Amount of unexpended balance refunded to Treasury near close of fiscal year 1905, but not carried to credit of appropriation by June 30, 1905 | | | | | | | 115.70 |
| Total balances | 194.00 | | 3,749.39 | | 7,085.85 | 1,247,587.66 | 1,465,237.38 |

In the foregoing expenditures for the fiscal year 1905 the following items of disbursements are included: Commutation of rations to cadets at the Military Academy, West Point, $46,689.30; to enlisted men on furlough, $76,982.93; to ordnance sergeants at posts not garrisoned, $1,729.20; to enlisted men on duty where rations could not be issued conveniently, $108,516.55; to enlisted men while traveling, $47,858.37; to enlisted men in Army and Navy General Hospital, Hot Springs, Ark., $11,439.87; commutation of fresh vegetables, $1,717.43; meals for recruiting parties and recruits and troops moving, $239,392.82; liquid coffee for troops traveling, $24,645.12; salaries to civil employees of the subsistence department at posts and stations, including wages of laborers and mechanics, fees of inspectors, and miscellaneous small employments, $233,334.97; salaries to civil employees of the subsistence department on transports, $182,150.14; board wages of civil employees of subsistence department connected with the transport service while ashore, $11,563.50; extra-duty pay, $30,145.55; advertising, $2,661.20; commercial newspapers, $20.95; printing, $3,298.76; rent of telephones, $2,080.25; ice for troops and refrigerating purposes, $84,878.29.

The following items of disbursements were made for the fiscal year 1904, but could not be included in the report for that year by reason of the delay in receiving the accounts at this office: Commutation of rations to cadets at the Military Academy, West Point, $4,155.60; to enlisted men on furlough, $5,056.25; to ordnance sergeants at posts not garrisoned, $24; to enlisted men on duty where rations could not be issued conveniently, $4,928.75; to enlisted men while traveling, $79; to enlisted men in Army and Navy General Hospital, Hot Springs, Ark., $1,023.20; meals for recruiting parties and recruits and troops moving, $4,476.59; liquid coffee for troops traveling, $38.21; salaries to civil employees of subsistence department at posts and stations, including wages of laborers and mechanics, fees of inspectors, and miscellaneous small employments, $377.43; salaries to civil employees of subsistence department on transports, $22; commercial newspapers, $3.45; rent of telephones, $130.26; printing, $142.01; advertising, $513.23; ice for issue to troops and for refrigerating purposes, $3,900.38.

## HOSPITAL ISSUES.

The supplies purchased and issued from stock on hand during the fiscal year for enlisted men in hospital, too sick to use the army ration, amounted in value to $231,525.51.

Like issues were made in fiscal year 1904, amounting to $2,105.61, but were not included in that report owing to the delay in the receipt of the accounts and returns at this office.

## VALUE OF ISSUES TO INDIANS.

| | |
|---|---|
| Indians in Alaska (destitutes) | $1,055.59 |
| Seminole-Negro Indian at Fort Clark, Tex | 56.24 |
| Indian prisoner (Chiricahua girl) | 44.05 |
| Apache Indians at Fort Sill, Okla | 9,914.24 |
| Total | 11,070.12 |

## VALUE OF ISSUES TO CIVIL EMPLOYEES.

| | |
|---|---|
| Civil employees of Quartermaster, Subsistence, Medical and Ordnance departments, and the Signal Corps | $271,278.49 |

## VALUE OF MISCELLANEOUS ISSUES.

| | |
|---|---|
| Military prisoners at posts (general prisoners) | $79,607.58 |
| Destitute citizens | 142.12 |
| Flood sufferers at Kansas City, Kans | 445.17 |
| Destitute ex-soldier, colored, at Fort Clark, Tex | 3.06 |
| Mexican military band, at Fort Sam Houston, Tex | 9.31 |
| Issues to native Federal prisoners at Malahi Island, P. I | 236.77 |
| Filipino insurgent prisoners, captured and in arrest | 730.78 |
| American prisoners at Bilibid Prison, Manila, P. I | 1,053.08 |
| Filipino military convicts at Bilibid Prison, Manila, P. I | 1,358.97 |
| Total | 83,586.84 |

## VALUE OF STORES SUPPLIED TO OFFICERS AND SAILORS OF THE NAVY IN THE FISCAL YEAR 1905.

Subjoined is a statement of the value of subsistence stores supplied to officers and sailors of the United States Navy and of amounts paid therefor:

| | Value. | Collected. |
|---|---|---|
| On transport Sumner | $15.41 | $15.41 |
| On transport Kilpatrick | 52.99 | 48.17 |
| On transport Dix | 3.26 | 3.26 |
| On transport Thomas | 241.72 | 148.23 |
| On transport Sherman | 320.46 | 112.92 |
| On transport Logan | 679.26 | 608.86 |
| On transport Sheridan | 82.78 | 82.78 |
| Transfers to navy paymasters on island of Guam by sundry officers of the Army in August, 1904, to May, 1905 | 12,976.93 | 9,931.31 |
| Total | 14,372.81 | 10,950.94 |
| Balance due and uncollected | ............ | 3,421.87 |

Claims have been made on the Navy Department for the value of the stores that have not been paid for and which are noted above as having been supplied.

Transfers were reported as made to navy paymaster on duty on island of Guam by the commissary at San Francisco in February, May, and June, 1905, but as the receipts of the officer receiving the stores have not yet reached this office claims for the value of the stores have not been made on the Navy Department.

## VALUE OF STORES SUPPLIED TO OFFICERS AND SAILORS OF THE NAVY IN THE FISCAL YEAR 1904.

The following is a statement of the value of subsistence stores supplied officers and sailors of the United States Navy in the fiscal year 1904 (the evidence of which was received too late to appear in the annual report of that year), and of the amounts received in fiscal year 1905 in settlements made pertaining to the fiscal year 1904:

| | Value. | Collected. |
|---|---|---|
| Transfers to navy paymaster on island of Guam by Maj. C. R. Krauthoff, commissary, in April and June, 1904 | $2,618.56 | $2,618.56 |
| For stores transferred as above in January, February, March, and May, 1904 | ............ | 4,288.33 |
| On the transport Sheridan, in March, April, and June, 1904 | ............ | 118.16 |
| On the transport Logan, in February and June, 1904 | ............ | 46.76 |
| On the transport Sumner, in June, 1904 | ............ | 5.13 |
| Total | 2,618.56 | 7,076.94 |

The difference between the debit and credit items is due to the fact that the debit difference appeared in the annual report of the fiscal year 1904.

### VALUE OF STORES SUPPLIED TO OFFICERS AND MARINES OF THE UNITED STATES MARINE CORPS, IN FISCAL YEAR 1905.

Below is a statement of the value of subsistence stores supplied to officers and marines of the Marine Corps in fiscal year 1905, and of amounts collected on account of same:

| | Value. | Collected. |
|---|---|---|
| At San Juan. P. R | $10,131.51 | $9,177.40 |
| At Honolulu, Hawaii | 1,560.84 | 1,560.84 |
| At Cavite, P. I | 52,268.76 | 49,063.19 |
| At Presidio of Asan, island of Guam | 231.15 | 231.15 |
| At Polloc, P. I | 625.40 | 344.41 |
| On transport Sheridan | 1,650.36 | 962.86 |
| On transport Sherman | 675.31 | 334.50 |
| On transport Kilpatrick | 9.35 | 11.33 |
| On transport Logan | 831.67 | 825.07 |
| On transport Thomas | 1,476.49 | 1,094.50 |
| Total | 69,460.84 | 63,605.25 |
| Balance due and uncollected | | 5,855.59 |

Claims have been made on the Navy Department for such of the above sums as are still due, most of which have been reported to the Auditor for the Navy Department for favorable action. Explanation has been requested as to excess collection of $1.98 in above item on transport *Kilpatrick.*

### VALUE OF STORES SUPPLIED TO OFFICERS AND MARINES OF THE UNITED STATES MARINE CORPS IN FISCAL YEAR 1904.

The following is a statement of the value of subsistence stores supplied for use of marines in fiscal year 1904 (the evidence of which was received too late to appear in the annual report of that year), and of the amounts received in fiscal year 1905 in settlements made pertaining to the fiscal year 1904:

| | Value. | Collected. |
|---|---|---|
| At San Juan, P. R | | $1,583.87 |
| At Cavite, P. I | | 18,262.83 |
| At Isabela de Basilan, P. I | | 30.11 |
| At Polloc, P. I | | 562.80 |
| At Honolulu, Hawaii | | 1,162.69 |
| On transport Buford | | 5,725.06 |
| On transport Sheridan | $1,472.22 | 1,598.73 |
| On transport Sherman | 36.81 | 35.56 |
| Total | 1,509.03 | 28,961.65 |

The difference between the debit and credit items is due to the fact that the debit difference appeared in the annual report of the fiscal year 1904.

## VALUE OF STORES SUPPLIED VARIOUS PARTIES, AND COLLECTIONS THEREFOR.

Below are a number of miscellaneous cases where stores were reported as suppled to various parties, and amounts reported collected in connection therewith:

| | Amount. | Collected. |
|---|---|---|
| To Porto Rico school teachers, in July and August, 1904 | $8,193.40 | $8,193.40 |
| To members of Philippine constabulary, in January, 1905 | 14.85 | 14.85 |
| To Medical Department, malted milk, in July, August, and November, 1904, and February and May, 1905 | 991.44 | 991.44 |
| To two parties rendered homeless by fire, in February, 1905 | 46.24 | 46.24 |
| To A. B. Stuart, insular prisoner, in July, 1904 | 23.25 | 23.25 |
| To destitute Philippine women, in July, 1904 | 23.25 | 23.25 |
| To destitute American seamen, in August and September, 1904 | 12.02 | 7.43 |
| To Louis McCutchen, clerk in Ordnance Department, in September and October, 1904 | 33.00 | 33.00 |
| To deported Chinamen, in November, 1904 | 13.20 | 13.20 |
| To N. Wittenberger, employee of Ordnance Department, in December, 1904 | 19.75 | 19.75 |
| To A. Garecki, employee of insular department, in April, 1905 | 8.33 | 8.33 |
| To Mrs. Lease, wife of Corporal Lease, Sixth Infantry, in March, 1905 | 23.00 | 23.00 |
| To indigent citizen sent home by insular government in May, 1905 | 4.00 | 4.00 |
| To teamsters, employees of insular government, Philippine Islands, in August, September, and December, 1904, and February, 1905 | 1,842.26 | 1,842.26 |
| To W. C. Owens, employee of civil government, Philippine Islands, in May, 1905 | 17.60 | 17.60 |
| To J. G. McGrath, clerk in Subsistence Department, in June, 1905 | 11.90 | 11.90 |
| To W. W. Mattinson, clerk in Subsistence Department, in June, 1905 | 7.76 | 7.76 |
| To E. Huff, clerk at headquarters, Philippines Division, in June, 1905 | 15.52 | 15.52 |
| To A. Feusch, clerk in War Department, in June, 1905 | 11.64 | 7.76 |
| To employees, Quartermaster's Department, in August, 1904 | 15.50 | ........... |
| To H. G. Robertson, ex-corporal, Thirty-eighth U. S. Volunteers, Quartermaster's Department, April and May, 1905 | 20.00 | 20.00 |
| Total | 11,347.91 | 11,323.94 |
| Balance due and uncollected | ........... | 23.97 |

Steps have been taken to collect the amounts for which payments have not yet been reported.

The following amounts of miscellaneous debits in report of prior fiscal year have since been reported as paid:

| | |
|---|---|
| On account of malted milk supplied Medical Department, U. S. Army, by Maj. D. L. Brainard, commissary, U. S. Army, in June, 1904 | $110.16 |

## SALES OF SUBSISTENCE STORES.

| | Appropriation "Subsistence of the Army." | | | |
|---|---|---|---|---|
| | 1902. | 1903. | 1904. | 1905. |
| To officers | ........... | ........... | $975.08 | $668,974.33 |
| To enlisted men, companies, detachments, and hospitals | $48.50 | $104.51 | 2,656.54 | 1,070,238.29 |
| To civilians | ........... | ........... | 505.19 | 208,310,99 |
| To Quartermaster's Department | ........... | ........... | ........... | 3,035.73 |
| To post exchange | ........... | ........... | 288.41 | 165,147.22 |
| To Indians, Indian agents, and employees | ........... | ........... | ........... | 2,898.97 |
| To officers and enlisted men of United States Navy and Marine Corps | ........... | ........... | ........... | 198,590.98 |
| To post bakeries | ........... | ........... | ........... | 91.34 |
| To court officers, Alaska | ........... | ........... | ........... | 4,463.74 |
| To United States Coast and Geodetic Survey | ........... | ........... | ........... | 5,009.67 |
| To coast guard | ........... | ........... | ........... | 19,940.08 |
| At auction | ........... | ........... | ........... | 4,876.84 |
| Meals to passengers on transports | ........... | ........... | 1,156.29 | 128,036.11 |
| Sales specially authorized | ........... | ........... | ........... | 9,274.17 |
| To organized militia, officers and enlisted men | ........... | ........... | ........... | 12,548.98 |
| Total sales | 48.50 | 104.51 | 5,581.51 | 2,501,437.44 |

## SALES ON CREDIT.

Sales on credit to officers of the Army during the fiscal year ended June 30, 1905, as shown by the accounts of that year thus far received, amount to $11,753.66, and sums thus far reported as collected through the Pay Department and otherwise settled amount to $9,800.95 (this sum includes 27 cents of overcollections and 1 cent of undercollections), leaving the sum of $1,952.97 yet to be collected.

Of the amount due from officers in the fiscal year 1904, the sum of $1,274.57 has been reported as collected. This includes $93.20 not included in the report of that year.

The sales on credit to enlisted men of the Army amount to $21,109.48, of which the collections by the Pay Department on muster and pay rolls and on final statements, on account of credit sales, total $27,404.41. The excess in collections over and above the amount of the debit is due presumably to collections made on account of sales in prior fiscal years and which were not collected in those years.

Sales on credit to enlisted men in fiscal year 1904 not heretofore reported amount to $30.69, and the collections on account of credit sales in that fiscal year which were not heretofore reported amount to $2,686.28.

## LOSSES.

The total amount of losses in the Subsistence Department for the fiscal year was $97,327.42. But from this total a deduction of $4,503.75 is to be made on account of reclamations made on dealers for supplies which were found to be unsatisfactory, and for $4,876.84, amount from sales at auction for supplies that were condemned and ordered sold. These two items amount to $9,380.59. With the foregoing deduction, the net losses for the entire fiscal year are $87,946.83. The losses during the year were attributable to various causes. The sum of $16,860.24 was due to ordinary wastage, $63,903 to natural causes, $3,066.23 to shortages by certificate, $204.61 to theft, $9,063.60 to fire, $463.23 to property acted on by surveying officers, and $3,766.51 to property not acted on by surveying officers. The losses occurred in geographical divisions as follows: In the United States, $18,949.18; the Philippines, $73,824.43; Alaska, $2,541.71; Porto Rico, $486.84; Hawaii, $140.28; China, $547, and on transports, $837.98.

Every possible effort has been made to prevent losses, and the result has been gratifying; still the conditions this year were far more favorable than in the previous one. This reduction in losses was largely due: first, to the intelligent revision made by chief commissaries of requisitions received; second, to the care and technical skill of the purchasing commissaries who procured the stores; third, to careful handling after stores were received, and fourth, to the frequency of supply.

Conditions will continue to improve each year, and especially in the Philippine Islands. During the past fiscal year the percentage of losses of stores and property supplied for use of the Army in the Philippines was 3.29 per cent, while that for the United States and all other places except the Philippines was 0.49 of 1 per cent. It is doubtful if as good a showing is made, considering all the circumstances, by concerns doing business in the commercial world.

Similar losses occurred in previous fiscal years and were found in delayed returns, and consequently could not be included in the annual reports of those years. They amounted to $978.82 in the fiscal year 1901, $4,193.76 in 1902, $2,127.85 in 1903, and $20,313.07 in 1904.

### POST COMMISSARY SERGEANTS.

The number of post commissary sergeants in the service at the beginning of the year was 198. During the period of this report 12 were appointed, 7 were discharged, 4 retired, and 1 died, leaving 198 in the service at the end of the fiscal year 1905.

### CLAIMS.

The number of claims on hand, received, and disposed of during the fiscal year were as follows:

| | Claims for commutation of rations. | | |
|---|---|---|---|
| | While held as prisoners of war in rebel States and in the Philippines. | While on furlough, and miscellaneous claims. | Total. |
| On hand June 30, 1904 | ............ | 3 | 3 |
| Received during fiscal year 1905 | 164 | 192 | 356 |
| Total | 164 | 195 | 359 |
| Disposed of during year | 163 | 192 | 355 |
| On hand June 30, 1905 | 1 | 3 | 4 |

The number of letters and indorsements written during the year in connection with the above claims was 959.

### ACCOUNTS AND RETURNS.

The following statement shows the number of accounts current and returns of subsistence stores and property on hand June 30, 1904, received and examined during the fiscal year ended June 30, 1905, and on hand at the close of the latter fiscal year awaiting examination:

| | Accounts current. | Returns of stores. | Returns of property. | Total. |
|---|---|---|---|---|
| On hand June 30, 1904 | 26 | 74 | 8 | 108 |
| Received during fiscal year 1905 | 4,387 | 2,728 | 1,192 | 8,307 |
| Total | 4,413 | 2,802 | 1,200 | 8,415 |
| Disposed of during year | 4,350 | 2,679 | 1,193 | 8,222 |
| On hand June 30, 1905 | 63 | 123 | 7 | 193 |

The examination of the accounts required the verification of 111,797 vouchers, the returns of stores 52,793 vouchers, and the returns of property 3,607 vouchers. In connection with the examinations 5,486 postal cards were used, 5,704 letters and 4,812 indorsements were written and recorded, 1,270 papers copied, and 412 days of time consumed on work not classified.

## CONTRACTS.

Contracts to the number of 709 were made for subsistence supplies and 584 for meals and lunches for recruiting parties and recruits, making a total of 1,293 contracts acted on and disposed of during the fiscal year. The contracts for meals and lunches have caused considerable labor, owing to a ruling of the Comptroller of the Treasury, under which formal written contracts are now required to be executed in lieu of the former method of treating such transactions, which was by written proposal and acceptance.

## CERTIFICATES OF SERVICE AND NONINDEBTEDNESS.

Certificates of service as acting commissary were issued in duplicate to the number of 505, and certificates of nonindebtedness issued to the number of 2,546.

## CLERICAL FORCE.

The clerical force of the office is diligent and efficient. A slight increase of pay was recommended in the annual estimate for the next fiscal year for five of the clerks of long service and experience, in justice to these faithful and deserving employees, who possess exceptional qualifications. Their remuneration is not adequate to the responsibility imposed or the important services rendered. The entire cost will involve only an annual expenditure of $1,050.

## MILITIA.

### 1. EXPENSES OF ORGANIZED MILITIA IN JOINT ENCAMPMENT, MANEUVERS, AND FIELD INSTRUCTION WITH THE REGULAR ARMY.

Under the provisions of the act of April 23, 1904 (33 Stat. 265), the sum of $100,000 was appropriated for the purchase of subsistence and supplies for the use of the organized militia of any State, Territory, or District of Columbia participating in the joint encampment, maneuvers, and field instruction of the Regular Army and militia as provided by sections 15 and 21 of the act of January 21, 1903, entitled "An act to promote the efficiency of the militia, and for other purposes." A proviso was inserted in the bill making the appropriation to the effect that the sums appropriated for the above-stated purpose were to be disbursed as and to constitute one fund; and also required a detailed statement of the expenses of such encampments and maneuvers to be forwarded to Congress at its next session. The following is a detailed statement of the expenses chargeable against the appropriation of $100,000 for the purchase of subsistence and supplies:

| | |
|---|---|
| Amount disbursed for articles of the ration | $48,681.91 |
| Value of issues made to sick in hospital from stores on hand | 4,747.34 |
| Hospital special diet, cost of stores purchased | 95.84 |
| Commutation of rations for men traveling on detached duty | 12.00 |
| Commutation of liquid coffee for troops traveling | 11,728.09 |
| Salaries to civil employees in the Subsistence Department | 1,055.23 |
| Purchase of ice | 1,027.02 |
| Total expenses | 67,347.43 |

There are still some items of expenditure in process of adjustment which will, when final settlement is reached, increase by several hundred dollars the foregoing total expenses for subsisting the militia.

### 2. DISTRICT OF COLUMBIA MILITIA.

The militia of the District of Columbia were supplied in August, 1904, and June, 1905, under the provisions of the act of March 1, 1889, and by direction of the Secretary of War, rations to the value of $4,146.55. It is thought that the expenses of the regular encampment of the entire organized militia of the country are fully provided for under the act of January 21, 1903. The act itself embodies an extensive scheme to promote the efficiency of the organized militia of the States, Territories, and District of Columbia, and it is believed that Congress intended to place the militia of the whole country on the same basis, and not to make an exception in favor of that of the District of Columbia by which it may share the benefits of two appropriations for identically the same thing, as it would practically do if allowed the benefits arising under the act of March 1, 1889 (25 Stat., 780), and the act of January 21, 1903, which enlarged the application of the act of June 6, 1900 (31 Stat., 662, and 32 Stat., 775).

## COST OF SUBSISTING WEST POINT CADETS AT INAUGURAL CEREMONY.

Under the provisions of the act of March 2, 1905 (33 Stat., 834), the sum of $1,080 was appropriated for the extraordinary expense of subsistence of West Point cadets while attending the inaugural ceremony. Of the amount thus provided, only the sum of $886 was expended for the purpose mentioned.

## TRAINING SCHOOL FOR BAKERS AND COOKS.

Under the provisions of General Orders, Nos. 2 and 63, War Department, 1905, a training school for bakers and cooks was established at Fort Riley, Kans., under the direction of the commandant of the school of application for cavalry and field artillery, and Capt. M. S. Murray, of the Subsistence Department, was placed in immediate charge.

The system contemplates successive classes, which are to be instructed for periods of four months. The classes under instruction are to be composed of selected recruits of common-school education who manifest a desire to learn the trade of baker or cook and show an aptitude for the work. Upon completion of the prescribed course the men composing the class will be assigned to organizations.

The establishment of a school for cooks is a matter of great importance to the Army, and for twenty years the Subsistence Department has endeavored to secure its accomplishment. It was first favorably recommended by General Macfeely in 1876, then Commissary-General, and in succeeding years the subject was taken up by a board of officers who recommended such a school, and its establishment has since been repeatedly urged by myself.

The Government should not be content with issuing good rations alone, but should in every way facilitate their preparation. The health and strength, the success or failure of an army frequently depends upon the inglorious proposition of getting something to eat.

To sum up some of the advantages of the school: the expense will be very slight; it will effect a great saving, because it will make the ration go further; the quality of the food will be better; it will conduce to the health, strength, and content of the troops, and will tend to lessen desertions.

### FIRELESS COOKING.

This Department has been making a series of experiments with fireless cooking apparatus, with a view to its utilization by troops in garrison, and particularly in the field. These experiments have been carried out in connection with the school for bakers and cooks at Fort Riley, Kans., with very crude apparatus constructed at the post. On a recent march made by one of the light batteries of 25 miles through a rough country, this crude apparatus was used, and by means of it a hot meal was served to the command of 128 men immediately after making camp at the end of the day's march, enabling the camp to be properly laid out, the horses to be cared for and fed, and then the men simply formed in line and a hot meal was issued to them from this crude apparatus.

A series of experiments were conducted at New York under my supervision with an apparatus prepared by a gentleman of that city, at which were present Capt. M. S. Murray, commissary, from Fort Riley, Kans. (who is in charge of the school for bakers and cooks), and all of the officers on duty in the subsistence depot at New York. These experiments were successful, and it is now desired to undertake more elaborate experiments at Fort Riley, so as to ascertain the exact possibilities of this device for the use of troops in garrison and in the field.

There is no question as to the superiority of the cooking by this method in comparison with the old, and this is readily explained by the fact that by the old method of cooking in open vessels the aroma escaped; by this method the vessels must necessarily be closed, and thus the aroma of the articles is retained and the food made much more palatable. What is desired is to prove the adaptability of this apparatus for the use of troops, particularly in the field, and if it is applicable in the field the same economy in fuel would be effected as in garrison.

### WRAPPED SOFT BREAD IN LIEU OF HARD BREAD.

The director of the school of bakers and cooks has been experimenting with a wrapped soft bread to be issued in lieu of hard bread to troops traveling by rail. This gives every promise of being successful, and if so will be a very desirable improvement over the old method and do away with the complaint of troops who have to use hard bread when traveling. There will also be a large saving to the Government in cost. At present hard bread costs about 4¼ cents per pound, while the soft bread, wrapped as proposed, will only be about 2½ cents per pound.

### TESTING FLOUR.

The Subsistence Department lacks exact methods for determining the quality of flour purchased save those referred to in the Handbook of Subsistence Stores, which in a measure imply that the operator is an expert judge of flour. It requires time and practice to become an adept in testing flour, and even then one is not always sure of accurate results when determined by the methods above indicated; for instance, as to how much bread a given quantity of flour would make, for he would be ignorant of its absorbent power, the quality of the gluten, and unable to tell the quality of the bread which the flour would produce. All these are vital points for the purchasing officer to know before flour is purchased.

With a knowledge of our requirements and methods, Maj. B. K. West, chief commissary of the Department of the Colorado, carried on a series of experiments looking to a scientific and at the same time a simple test of flour. He tried along lines which were followed in a large flour mill at Denver, and upon his recommendation the necessary apparatus for making tests was authorized to be installed at purchasing stations where large quantities of flour are to be procured.

### RATIONS FOR OFFICERS AND CIVILIAN EMPLOYEES WHILE SERVING IN THE FIELD.

I renew the recommendation made in 1895 by my predecessor that officers and civilian employees serving in the field be allowed one ration each per day. He stated in his annual report of that year:

> When troops are hurriedly ordered into the field, as they are usually in our Army, the officers should be able to give their undivided attention to the proper equipment of their companies and not be interrupted by the necessity of selecting and gathering personal supplies. Taking the field hurriedly as above, there may be no stores taken for sales, and in a sparsely settled country none may be found. In such cases officers are forced to live off the rations issued to the enlisted men of the company, paying, it is true, to the company fund the value of the rations used, but the company is deprived of a portion of its food at a time when it is most needed. I therefore believe, for military reasons, that it is desirable to issue rations to every person ordered on active service away from a garrison and liable to be surrounded by a hostile enemy or to serve among disaffected people. When transportation is limited the chances are that the ration articles only will be carried. On taking the field the officer must leave his quarters, his family, his established mess, and if mounted he must employ at his own expense a hostler as well as a cook. The additional expense entailed upon him, though incidental to the service, is not trifling in amount when purchases, if possible to be made, have to be made at a distance from the regular markets.

It is to be hoped that the measure will meet the approval of the Secretary of War, and be by him commended to the favorable consideration of Congress.

If this issue is not favorably considered it is recommended that the articles that are kept for sales in the field, in addition to components of the ration, be limited to ten in number, selected from the following list:

Butter, in tins.
Buttons, metallic.
Clotheslines.
Can openers.
Cigars.
Chocolate, sweet.
Peas, canned.
Envelopes, letter, No. 6.
Milk, evaporated.
Needles.
Pencils, indelible.
Pipes.
Peaches, canned.
Prunes.
Shoe strings, linen.
Soap, white, floating.
Tablet, letter.
Thread, linen, white.
Tobacco, plug.
Tobacco, Durham.
Towels, huckaback.

In the field and in time of war, tobacco should be made part of the ration.

## BOOK OF HANDY REFERENCE.

This is a small printed book of canvas cover, containing 15 pages, and is of convenient size to slip into the pocket. It was compiled and printed during this year, and is for use of commissaries when issuing rations at places where proper scales, measures, and other facilities are not available. Information contained in the book is mainly intended for use in the field, or under stress of circumstances where it is impossible to secure the usual facilities required for making issues in the regular way. Occasion has often arisen in the Philippines, and also occurred during the Spanish war, for the use of such a guidebook, and in any future war may easily occur again.

## SETTLEMENT OF ACCOUNTS UNDER ACT OF MARCH 3, 1903.

This act provided for the settlement of certain accounts of disbursing officers of the War Department, arising between April 21, 1898, and July 8, 1901. The life of the act was limited to two years from its passage on March 3, 1903. There were in all 247 cases pertaining to the Subsistence Department, which came within its operation. At the close of the preceding fiscal year only 12 cases remained to be adjudicated, and all of them were disposed of within the period allowed for the operation of the act.

## ICE.

Ice is an item of considerable expense and when procured its care is an important feature of economy. It is thought that at posts where it is practicable to do so ice houses should be furnished and troops required to store ice for use during the summer months. The prices which the Subsistence Department is called upon to pay at most of the posts are considered very high. At all large posts ice machines should be installed with cold-storage connections.

## SAVINGS.

The chief commissary of the Department of the Missouri reports for the past fiscal year that:

> Post commissaries purchased 338,595 pounds of bacon as savings during the past year of 689,000 pounds issued. This was almost 50 per cent of the toal amount issued. There were 892,256 pounds of flour saved—about 30 per cent. Forty-one per cent of the coffee ration, 17 per cent of the sugar ration, 28 per cent of the vinegar ration, 15 per cent of the salt ration, 12 per cent of the pepper ration, and 23 per cent of the soap ration were purchased as savings by commissaries during the year.

The foregoing facts are a forcible illustration that the army ration is fully adequate.

## SUBSISTENCE FUNDS HELD IN HAND FOR READY DISBURSEMENT.

I again urgently recommend the passage of a bill by Congress to give authority to all officers intrusted with the disbursement of subsistence funds to hold restricted amounts of such funds in their personal possession. The exigencies of the public service require an open disregard of the restrictions of the existing law in cities where the treasurer or an assistant treasurer is located.

A bill which was intended to meet the necessities of the case passed the Senate March 24, 1900 (S. 2870), a copy of which is appended:

AN ACT concerning disbursing officers of the Subsistence Department of the Army.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That officers intrusted with the disbursement of funds for the subsistence of the Army are hereby authorized to keep, at their own risk, in their personal possession for disbursement, such restricted amounts of subsistence funds for facilitating payments of small amounts to public creditors as shall from time to time be authorized by the Secretary of War.

## AUTHORITY FOR DISPOSITION OF SUBSISTENCE STORES NO LONGER REQUIRED.

I have the honor to again urge upon the Secretary of War the need of legislation authorizing the sale at public auction of subsistence stores in good condition which may at any time accumulate in excess at any depot or point of supply and which can not advantageously or economically be transported to other points for issue or sale to troops. The draft of a bill to accomplish the object desired, heretofore submitted by this office, is as follows:

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Secretary of War may cause to be sold at public sale, under regulations to be prescribed by him, such subsistence stores in good condition, intended for issue or for sales to officers and enlisted men, as may from time to time accumulate at any subsistence depot, military post, or in the field, in excess of amounts required for use and which can not, with economy and advantage, be shipped to other subsistence depots, posts, or places for military use, the proceeds to be immediately available for general disbursement, under the appropriation for subsistence of the Army current at the time of sale for any of the objects contemplated by that appropriation.

As the proceeds of all sales of subsistence supplies are, by the act of March 3, 1875 (18 Stat. 410), now "exempt from being covered into the Treasury" and are made "immediately available for the purchase of fresh supplies," the above-proposed legislation is in exact accord with existing law as to disposition of proceeds of authorized sales of subsistence supplies. There is no law, however, authorizing the sale to the public of subsistence supplies in bulk which are in good condition, the only legislation bearing on the subject of sales of military supplies (sec. 1241, Rev. Stat.) being general in its nature and providing only for the sale of stores which, upon proper inspection or survey, appear to be "damaged" or "unsuitable" for the public service. As all public sales of subsistence supplies in good condition in bulk now taking place are being made under the guise of the stores being "unsuitable," and such an appropriation of the wording of section 1241 to cover transactions which would else be without even the color of authority of law is strained and unsatisfactory, I earnestly recommend that the above draft of law be pressed upon the attention of Congress.

### MESSING TROOPS WHILE TRAVELING.

The subject of messing soldiers while traveling is one of great importance. It has engaged the attention of the Subsistence Department for a long time, but the problem of subsisting them in a satisfactory manner has not so far resulted in a successful solution. It is believed that the plan suggested by the chief commissary of the Department of the Colorado might be adopted with advantage and economy.

He believes that as large bodies of troops are constantly traveling to and from the Pacific coast, a standard kitchen car for a command of the size of a battalion of infantry or larger should be adopted. This would enable the command to be subsisted on the garrison ration and with much greater comfort and convenience than at present.

### SQUADRON OR BATTALION COMMISSARIES AS POST COMMISSARIES.

In the interest of good administration it is recommended that at posts where there is no regimental commissary, a squadron or battalion commissary be assigned to duty as post commissary.

### PHILIPPINES DIVISION.

The chief commissary of the Philippines Division comments as follows upon affairs in that division:

#### 1. SUPPLYING POSTS.

Until December 29, 1904, requisitions for stores for the departments of Mindanao and the Visayas were forwarded direct to this office from the various posts. On that date a division order, requested by this office, placed the responsibility for supplies in these departments in the hands of the respective chief commissaries, where it belonged, thus making these officers chief commissaries in fact as well as in name. This office, however, still exercises close supervision over the state of supplies in those departments, commissary books, which are carefully studied each month, being kept for each post.

#### 2. SOURCES OF SUPPLIES.

Out of nearly $2,250,000 worth of subsistence stores and property supplied for the use of the army in the Philippines during the fiscal year articles amounting to $1,025,598.18 were purchased to advantage in Manila. The remainder of the supplies, which make up the total, were procured in New York, Chicago, St. Louis, Kansas City, Omaha, and San Francisco, and shipped to destination.

#### 3. STORES PURCHASED IN MANILA.

The varieties of stores which can be purchased advantageously in Manila are: Fresh beef and mutton, rice, potatoes, onions, teas, sugars of all kinds, apple butter, creamery butter, cream cheese, Edam cheese, cigars, soda and water crackers, ginger ale, jams, currant jelly, Australian condensed milk, olive oil, olives, pickles (chowchow, gherkins, and mixed), raisins, table salt in bottles, Pears soap, effervescent water, steward's stores, and exceptional articles.

### 4. VALUE OF STORES PURCHASED IN MANILA.

The quantities and money value of subsistence stores purchased in Manila during the fiscal year are shown in the following table prepared by the depot commissary:

| Articles. | Quantity. | Cost. |
|---|---|---|
| Beef, fresh ... pounds | 6,137,333 | $398,926.66 |
| Mutton, fresh ... do | 185,130 | 16,198.89 |
| Potatoes, fresh ... do | 6,758,960 | 168,973.75 |
| Onions, fresh ... do | 1,133,530 | 33,439.14 |
| Ice ... do | 7,921,825 | 39,608.65 |
| Hard bread ... do | 37,000 | 2,405.00 |
| Rice, No. 1 ... do | 4,446,050 | 82,082.20 |
| Coffee, R. & G ... do | 17,250 | 3,265.00 |
| Tea: | | |
| E. B ... do | 10,000 | 2,950.00 |
| Ceylon ... do | 1,040 | 313.00 |
| Oolong ... do | 4,800 | 1,708.00 |
| Y. H ... do | 2,000 | 820.00 |
| Sugar, issue ... do | 1,380,085 | 44,745.17 |
| Matches, safety ... boxes | 1,727,820 | 3,653.88 |
| Apple butter, 3-pound ... crocks | 5,760 | 2,007.36 |
| Butter: | | |
| 1-pound rolls ... pounds | 89,760 | 20,664.05 |
| 1-pound tins ... do | 224,218 | 53,372.26 |
| Cheese: | | |
| Cream ... do | 68,571 | 10,268.63 |
| Edam ... number | 5,389 | 2,989.74 |
| Crackers: | | |
| Soda ... pounds | 14,494 | 2,739.37 |
| Water ... do | 1,200 | 224.40 |
| Jams, assorted, 2-pound ... cans | 14,397 | 2,762.06 |
| Milk, condensed, unsweetened ... gallons | 7,149 | 7,210.93 |
| Oil, olive, quarts ... bottles | 11,731 | 5,384.41 |
| Olives, pints ... do | 8,400 | 2,806.00 |
| Pepper, red, Cayenne ... pounds | 31⅝ | 15.24 |
| Pickles: | | |
| C. C., pints ... jars | 4,800 | 1,110.00 |
| Mixed, pints ... do | 5,997 | 1,398.06 |
| Salt, table ... bottles | 13,090 | 1,561.49 |
| Soap, toilet, P. G ... cakes | 80,884 | 7,801.98 |
| Sugar: | | |
| C. L ... pounds | 35,800 | 3,068.70 |
| Granulated ... do | 744,600 | 25,341.09 |
| Powdered ... do | 6,000 | 480.00 |
| Tansan: | | |
| Pints ... bottles | 134,112 | 7,376.16 |
| Splits ... do | 153,100 | 4,907.20 |
| Cigars ... number | 2,527,000 | 46,684.00 |
| Cigars, for export ... do | 559,600 | 10,393.58 |
| Miscellaneous | ............ | 908.67 |
| Steward's stores[a] | ............ | 3,708.33 |
| Exceptional articles | ............ | 1,325.13 |
| Total | ............ | 1,025,598.18 |

[a] January 1 to June 30 only.

### 5. QUALITY OF STORES.

The quality of stores received from the United States has been uniformly satisfactory. There still remains in the division a surplus of some articles of old stock received in excessive amounts in the early days. These include the following perishable articles: Canned roast beef, beef and vegetable stew, yeast, desiccated potatoes and onions, emergency rations, beef extract, and malted milk. Every proper expedient has been resorted to to reduce this stock. Condemnations, however, have been heavy, and it is feared that much of the beef and vegetable stew, desiccated vegetables, and emergency rations remaining will be a total loss. When these articles shall have been finally disposed of, the losses of stores in the Philippines by deterioration will be inappreciable, except in the item of fresh potatoes.

### 6. FRESH BEEF AND MUTTON.

The fresh beef and mutton furnished under contract during the fiscal year have been of uniformly good quality. Hind-quarter beef only was furnished, giving great satisfaction to the troops. For the next fiscal year contract has been made with the same firm for both beef and mutton, hind-quarter beef only to be delivered. The price for next year is to be 6¼ cents for beef, as against 6½ cents for the year just closed. The price of mutton is reduced from 8¾ cents to 7 cents. The reduction in the price of beef will effect a saving during the year of about $16,000. During the fiscal year 1905 delivery was made once in about every three months. During the next year delivery is to be made by the terms of the contract every six weeks. This has resulted in decreasing the amount of cold-storage space required, so that there will be a saving to the Government during the year of $23,585.10 in the contract for rent of cold-storage rooms for the subsistence department.

### 7. FRESH VEGETABLES.

The potato is the great unsolved subsistence problem of the Philippines. In spite of the utmost endeavors of this department this year, last year, and previous years, the losses continue to be enormous and seem to be unavoidable. Vegetable houses have been constructed at most of the large posts, scores of laborers are employed in resorting potatoes at the depot before shipment, and the shipments are made in as small quantities and as frequently as possible, all to no avail. The potato does not like the climate. Losses on onions have been small.

It is thought that post gardens will solve the problem, and it is recommended that the planting of potatoes at all posts be made mandatory. Potatoes can be furnished to all posts from Manila, but the heavy losses seem not to justify further shipments if any other method of procuring potatoes is feasible. It is suggested that after completion of the present contract on June 30, 1906, no further purchases of potatoes be made by the subsistence department, except such amounts as may be required in the immediate vicinity of Manila, that commutation therefor be paid to all outside organizations, making them dependent for their supply of potatoes on their own gardens.

Meanwhile it is recommended that exhaustive experiments on the part of canners in the United States be encouraged with a view to the production of a satisfactory canned, baked, or boiled potato. The desiccated potato is not a substitute for the fresh article. * * *

The contract price for potatoes for the next fiscal year is 2.15 cents and for onions 2.4 cents. Last year the prices were 2.5 cents and 2.95 cents. A saving of about $29,000 is anticipated.

### 8. ICE.

Ice was furnished the subistence department for the preservation of subsistence stores by ice plants at 16 posts in the division. Ice for the same purpose and for issue has been purchased in Manila under contract with the Insular Cold Storage and Ice Plant at one-half cent a pound, to the extent of 7,921,825 pounds. A similar contract has been made for the next year.

It is believed that it would be a measure of economy for the War Department to own and operate its own plant in Manila. Not only would ice be cheaper, but the excessive charge for cold-storage space would be saved. An ice plant built on the new docks to be constructed, with chutes for loading vessels, would be a most profitable investment.

### 9. COMMUTATION OF RATIONS.

Payments of commutation of rations during the year have been heavy. During the first nine months of the fiscal year $62,533.67 were expended for this purpose as compared with $39,314.95 for the corresponding period of the previous year. This matter was taken up by this office with the division commander in January, 1905, with the result that commutation was abolished at numerous stations in the islands, and the authority of the Secretary of War was obtained for messing detached soldiers not exceeding five at hospital messes when no other American mess is available. It is believed that this item of expense might be still further reduced by a more strict interpretation of the requirements of paragraph 1255, Army Regulations, that "commutation of rations will not be allowed to enlisted men serving where subsistence is furnished by the Government."

### 10. POST COMMISSARY-SERGEANTS.

At the beginning of the fiscal year there were 66 post commissary-sergeants on duty in the division. Of these sergeants 2 were discharged during the year, 6 were relieved and sent to the United States on account of illness, 6 because their services were no longer required, and 8 because of expiration of tour of service. There was 1 appointment of post commissary-sergeant from enlisted men stationed in the islands, and 4 arrived during the year from the United States, making the total number present in the division at the close of the year 49, a net reduction of 17. The reduction was made possible by the abandonment of a number of posts and the abolishment of the commissaries at one-company scout posts.

Of these sergeants 35 are on duty at posts in the Philippines, 1 at Peking, China, 3 on interisland transports, 6 at the commissary depot in Manila, 2 on furlough in the United States, and 2 sick in hospital. Six new posts have been established in east Samar during the last half year on account of the active military operations in that region, and each of these posts has been assigned a post commissary-sergeant.

### 11. CIVILIAN EMPLOYEES.

*Clerks.*—At the close of the fiscal year 1904 there were 47 clerks on the rolls of the subsistence department in the division. This number has been reduced to 44, the minimum number consistent with efficient service. The card-record system has been established during the year in the various offices. It is well known that this system involves more clerical labor than any other system of keeping records, but the compensating advantages far exceed any additional labor and expense involved. The change of system was effected in this office without additional help and with no other interference to current business, well demonstrating the adaptability and ability of the clerks here employed.

During the year 2 clerks have resigned on account of their physical condition, 2 have been returned to the States sick, and 1 has died. Four others have resigned for various reasons and 1 has been dismissed. * * * Eighteen clerks who were classified under civil-service rules by Executive order of March 1, 1904, have been returned, or are under orders to return, to the United States.

*Other civil employees.*—Of messengers and laborers there are now employed in the subsistence department of this division 286, as against 299 at the close of the last fiscal year. Of this number 58 are on duty at posts, 7 in offices of division and department chief commissaries, 78 on interisland transports, and 143 at the depot in Manila. The force of laborers and messengers at the depot has been reduced by 4. Its pay roll still seems large and it is expected that new methods now being inaugurated may permit of some further reduction, but the minimum limit is about reached. As a matter of fact the force now employed is small when it is considered that 600,000 rations and $100,000 worth of sales stores are received and disposed of monthly.

J. F. WESTON,
*Commissary-General.*

The SECRETARY OF WAR.

# REPORT OF THE SURGEON-GENERAL.

# REPORT OF THE SURGEON-GENERAL.

War Department,
Office of the Surgeon-General,
*Washington, August 19, 1905.*

Sir: I have the honor to submit herewith a report upon the work of the Medical Department of the Army, beginning with a financial statement for the fiscal year ending June 30, 1905, and including a study of the health and sanitary conditions of the Army for the calendar year 1904.

### FINANCIAL STATEMENT, 1905.[a]

*Medical and hospital department, 1905.*

| | | |
|---|---|---|
| Appropriated by act approved April 23, 1904 | | $550,000.00 |
| Refundments on account of supplies transferred: | | |
| To Navy Department | $250.14 | |
| To States and Territories for use of organized militia | 21,900.43 | |
| Refundments on account of supplies sold: | | |
| To State of California for use of militia | 2,293.38 | |
| To civil government, Philippine Islands | 2,659.46 | |
| Other refundments during the year | 447.34 | |
| | | 27,550.75 |
| Total to be accounted for | | 577,550.75 |
| Disbursed during the year: | | |
| Expenses of medical-supply depots | 618.27 | |
| Medical supplies | 220,122.45 | |
| Medical attendance and medicines | 9,486.46 | |
| Medical expenses of recruiting | 44,327.44 | |
| Pay of nurses | 2,107.57 | |
| Pay of other employees | 141,156.57 | |
| Washing of hospital linen | 21,507.66 | |
| Expressage | 192.26 | |
| Notary fees | 66.50 | |
| | | 439,585.18 |
| Balances on hand June 30, 1905: | | |
| In United States Treasury and in transit thereto | 78,933.91 | |
| In hands of disbursing officers— | | |
| New York City | 25,822.76 | |
| Washington, D. C | 10,497.26 | |
| St. Louis, Mo | 15,434.28 | |
| San Francisco, Cal | 3,767.78 | |
| Manila, P. I | 3,509.58 | |
| | | 137,965.57 |
| Total accounted for | | 577,550.75 |

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[a] The disbursements in this statement include settlements with public creditors made by the accounting officers of the Treasury and charged by them to these appropriations.

### *Medical and hospital department, 1904.*

| | | |
|---|---|---|
| Balance on hand July 1, 1904, acts of March 2, 1903, and April 27, 1904. | | $189,235.69 |
| Refundments on account of supplies transferred: | | |
| To Navy Department | $323.56 | |
| To Isthmian Canal Commission | 228.48 | |
| To States and Territories for use of organized militia | 9,878.72 | |
| Other refundments during the year | 258.48 | |
| | | 10,689.24 |
| Total to be accounted for | | 199,924.93 |
| Disbursed during the year: | | |
| Expenses of medical-supply depots | 128.34 | |
| Medical supplies | 178,663.67 | |
| Medical attendance and medicines | 5,981.79 | |
| Medical expenses of recruiting | 4,734.89 | |
| Pay of nurses | 552.88 | |
| Pay of other employees | 2,200.23 | |
| Washing of hospital linen | 1,941.05 | |
| Expressage | 25.93 | |
| Notary fees | 16.00 | |
| | | 194,244.78 |
| Balances on hand June 30, 1905: | | |
| In United States Treasury and in transit thereto | 5,150.85 | |
| In hands of disbursing officer, Washington, D. C. | 529.30 | |
| | | 5,680.15 |
| Total accounted for | | 199,924.93 |

### *Medical and hospital department, 1903.*

| | | |
|---|---|---|
| Balance on hand July 1, 1904, act of June 30, 1902 | | $262,882.40 |
| Refundments during the year | | 178.30 |
| Total to be accounted for | | 263,060.70 |
| Disbursed during the year: | | |
| Medical supplies | $54,617.01 | |
| Expressage | 20.16 | |
| Miscellaneous | 6.25 | |
| | | 54,643.42 |
| Carried to surplus fund | | 208,417.28 |
| Total accounted for | | 263,060.70 |

### *Medical and hospital department, 1902 and prior years.*

| | |
|---|---|
| Refunded during the year | $40.70 |
| Carried to surplus fund | 40.70 |

### *Medical and hospital department, certified claims.*

| | |
|---|---|
| Appropriated by act approved March 3, 1905 | $8.40 |
| Disbursed during the year | 8.40 |

### *Judgments, Court of Claims (War).*

| | |
|---|---|
| Appropriated by act approved March 3, 1905, on account of claims arising under the Medical Department of the Army | $305.70 |
| Disbursed during the year | 305.70 |

### *Reimbursement to contract nurses.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of June 6, 1900 | $3,278.98 |
| Carried to surplus fund | 3,278.98 |

*Report of army board on origin and spread of typhoid fever, 1903–4.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of March 3, 1903 | $22,690.54 |
| Disbursed during the year | 3,036.53 |
| Balance on hand June 30, 1905 | 19,654.01 |

*Artificial limbs, 1905.*

| | |
|---|---|
| Appropriated by act approved April 28, 1904 | $120,000.00 |
| Disbursed during the year | 107,822.50 |
| Balance on hand June 30, 1905 | 12,177.50 |

*Artificial limbs, 1904.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of March 3, 1903 | $10,730.73 |
| Refunded during the year | 3.00 |
| Total to be accounted for | 10,733.73 |
| Disbursed during the year | 4,030.72 |
| Balance on hand June 30, 1905 | 6,703.01 |
| Total accounted for | 10,733.73 |

*Artificial limbs, 1903.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of June 28, 1902 | $52,168.84 |
| Disbursed during the year | 240.54 |
| Carried to surplus fund | 51,928.30 |
| Total accounted for | 52,168.84 |

*Appliances for disabled soldiers, 1905.*

| | |
|---|---|
| Appropriated by act approved April 28, 1904 | $2,000.00 |
| Disbursed during the year | 1,160.55 |
| Balance on hand June 30, 1905 | 839.45 |

*Appliances for disabled soldiers, 1904.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of March 3, 1903 | $763.90 |
| Disbursed during the year | 52.72 |
| Balance on hand June 30, 1905 | 711.18 |

*Appliances for disabled soldiers, 1903.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of June 28, 1902 | $823.09 |
| Carried to surplus fund | 823.09 |

*Army Medical Museum, 1905.*

| | |
|---|---|
| Appropriated by act approved April 23, 1904 | $5,000.00 |
| Disbursed during the year | 4,331.78 |
| Balance on hand June 30, 1905 | 668.22 |

### *Army Medical Museum, 1904.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of March 2, 1903 | $911.29 |
| Disbursed during the year | 712.37 |
| Balance on hand June 30, 1905 | 198.92 |

### *Army Medical Museum, 1903.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of June 30, 1902 | $77.34 |
| Carried to surplus fund | 77.34 |

### *Library, Surgeon-General's Office, 1905.*

| | |
|---|---|
| Appropriated by act approved April 23, 1904 | $10,000.00 |
| Disbursed during the year | 6,320.05 |
| Balance on hand June 30, 1905 | 3,679.95 |

### *Library, Surgeon-General's Office, 1904.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of March 2, 1903 | $3,492.78 |
| Disbursed during the year | 3,427.61 |
| Balance on hand June 30, 1905 | 65.17 |

### *Library, Surgeon-General's Office, 1903.*

| | |
|---|---|
| Balance on hand July 1, 1904, act of June 30, 1902 | $88.92 |
| Disbursed during the year | 8.00 |
| Carried to surplus fund | 80.92 |
| Total accounted for | 88.92 |

### *Furnishing trusses to disabled soldiers (sections 1176, 1177, and 1178, Revised Statutes, and act of March 3, 1879).*

| | |
|---|---|
| Balance on hand July 1, 1904 | $853.40 |
| Drawn during the year | 5,000.00 |
| Total to be accounted for | 5,853.40 |
| Disbursed during the year | 5,522.85 |
| Balance on hand June 30, 1905 | 330.55 |
| Total accounted for | 5,853.40 |

### *General summary of all appropriations.*

| | |
|---|---|
| Balances on hand July 1, 1904 | $547,997.90 |
| Appropriated | 692,314.10 |
| Refunded | 38,461.99 |
| Total to be accounted for | 1,278,773.99 |
| Disbursed | 825,453.70 |
| Carried to surplus fund | 264,646.61 |
| Balances on hand June 30, 1905 | 188,673.68 |
| Total accounted for | 1,278,773.99 |

## THE ARMY.

Since the Spanish-American war important changes have taken place in the conditions under which American troops are serving. Before that time their stations were practically confined to the geographical limits of the United States proper, while now they are serving also in Alaska, Hawaii, China, and the Philippine Islands. Before that time, also, with the exception of a few Indians, there were no native troops; now there are native troops both in Porto Rico and the Philippines. For these reasons, and for purposes of better comparison with foreign armies, the arrangement of the annual report has been materially changed this year. The Army has been divided into the American Army proper, white and colored, which alone is meant when the "Army" is referred to, and is used in all comparisons with foreign armies and native troops—Porto Rican and Filipino—which are separately considered.

This year for the first time, too, admissions represent admissions strictly. This change will cause a somewhat higher admission rate than would have resulted under the old method where admissions really represented cases.

## HEALTH OF THE ARMY.

The mean enlisted strength of the Army, American troops, white and colored, for the year 1904, as reported on the monthly sick reports of the Medical Department was 58,740, and on returns to The Military Secretary, 60,139. As the former figure represented the strength of the commands from which the sick returns were made it has been used in calculating all ratios, except those for deaths and discharges. As all deaths and discharges were reported, no matter whether or not occurring with a command, the total strength as obtained from The Military Secretary was used in calculating ratios pertaining to those subjects.

The total number of admissions to sick report was 79,586, equal to an admission rate of 1,354.89, as compared with 1,507.43 for the previous year and 1,985.60 for the quinquennial period 1898–1902.

There were 406 deaths from all causes, equal to 6.75 per thousand, as compared with 8.64 for the previous year and 17.39 for the quinquennial period.

The discharges for disability were 1,377, and the rate 22.90, as compared with 25.87 for the preceding year and 22.87 for the quinquennial period.

The number of men constantly noneffective was 2,925.31, giving a rate of 49.80, as compared with 54.78 for the American and native troops combined for the preceding year.

These proportions are very satisfactory and show a steady and progressive improvement in the health of the Army.

By far the most important diseases affecting the efficiency of the Army during the year have been the venereal, which were first in admissions (188.34), noneffectiveness (12.17) and discharges (3.69), causing 16 per cent of all admissions, 28 per cent of all noneffectiveness, and 18 per cent of all discharges for disease. There were constantly on sick report for this class of diseases 715 men, equal to the loss for the entire year of the services of 11 full companies of infantry. The admission rate was considerably higher than for last year, venereal diseases having advanced from third place to first.

The control of these diseases lies largely in the hands of the civil authorities, and one of the most important steps to that end would appear to be the classing of diseases of this character with other infectious diseases, and the requirement that they shall be reported as such and controlled by health departments.

In the military service a similar course should be followed. At many posts a regular physical inspection of the enlisted men stripped is held once or twice a month, and all men found suffering from venereal diseases are placed under treatment and kept under observation and such measures of restraint as may be necessary until they are cured. It is recommended that these measures be required at all posts.

Soldiers suffering from syphilis, unless with infectious lesions, do not ordinarily require to be excused from duty while undergoing treatment and are usually readily amenable to such treatment, hence their discharge for disability should be exceptional; but owing to the frequency of relapse it is recommended that no soldier who has had syphilis should be reenlisted unless his character and the nature of his service is such as to entitle him to special consideration.

After venereal diseases in order of admission and noneffectiveness were diarrheal diseases, the proportions for which, however, admission 108.36 and noneffective 3.87, show a decided improvement over those for last year.

The figures for malarial diseases, admission 84.36, noneffective 1.87, also showed a marked reduction as compared with 1903; these diseases fell from first place to third in order of occurrence.

As a cause of death, pneumonia advanced to first place with a rate of 0.65, tuberculosis was second with a rate of 0.57, typhoid fever third, rate 0.33, while for diarrheal diseases the figure of last year was reduced more than one-half, to 0.30.

The case mortality of certain special diseases noted was as follows:

| | Per cent. |
|---|---|
| Epidemic cerebrospinal meningitis | 58.33 |
| Pneumonia | 15.60 |
| Tuberculosis of the lungs | 12.00 |
| Typhoid fever | 7.14 |
| Erysipelas | 6.25 |
| Measles | 1.65 |
| Dysentery | 1.13 |
| Syphilis | .10 |

As a cause of discharge for disability venereal diseases led, tuberculosis was second with a rate of 1.80, insanity third, rate 1.46, and organic disease of the heart fourth, with 1.36 per thousand of mean strength.

By reference to the table[a] of causes of discharge for disability, it will be seen that of the total 1,377 discharges for disability, 793, or 57.59 per cent, were for disabilities not in the line of duty, of which 546, or 68.85 per cent, were contracted before enlistment; 279 men were discharged within three months after enlistment.

A study of the causes of the discharges for disabilities contracted before enlistment shows that with few exceptions they should have been discovered by the medical examiner, and a large majority of them should not have been overlooked even by the recruiting officer. Of the 584 discharges in the line of duty 82 were for injuries; of the remaining 502, 19 per cent were for tuberculosis, 10 per cent for insanity, 8.5 per cent for diarrheal diseases, and 7 per cent for diseases of the ear.

---

[a] Omitted.

There were 206 admissions for gunshot wounds, with 44 deaths, and 2,850 admissions for wounds other than gunshot, with 15 deaths. Twenty-one men were killed in action and 42 wounded; of the killed 2 were by gunshot; of the wounded 28 were by gunshot. There were 45 soldiers drowned, 11 per cent of the total deaths from all causes, indicating how important it is that all soldiers should have systematic instruction in swimming. Twenty-seven soldiers committed suicide; 10 deaths were due to homicide.

Notwithstanding that a large part of the army was serving in the Tropics there was no admission for snake bite.

## OFFICERS.[a]

The mean strength of officers was 3,421 from the Medical Department reports and 3,815 from The Military Secretary. There were 2,276 admissions, 27 deaths, and 106.82 constantly noneffective from all causes, equal to proportions of 665.30, 7.08, and 31.25, respectively, compared with 1,354.89, 6.75, and 49.80 for enlisted men. It will be seen that the admission rate was less than one-half that for enlisted men and the constantly noneffective figure considerably lower. The death rate was higher, but this is due to the much larger porportional number of deaths among officers from gunshot wounds, the respective death rates from disease being 2.62 for officers and 3.87 for enlisted men.

Influenza was of first importance as a cause of admission from disease, with a rate of 68.99; diarrheal diseases, malaria, bronchitis, and dengue followed in regular order, with rates of 65.47, 48.52, 43.26, and 11.40, respectively. Heart disease caused the most deaths from disease, 0.79 per thousand; there were 11 deaths from wounds and 1 officer was drowned.

## THE INFLUENCE OF ARM OF THE SERVICE.

For disease, the engineers had the highest admission rate, with the cavalry next, and the ordnance the lowest. For injuries, the cavalry had the highest admission rate, the engineers next, and the medical department the lowest.

In discharges for disease, the cavalry had the highest figure, with the coast artillery second, and the ordnance lowest; in discharges for injury, the cavalry again led, with field artillery second; the engineers and signal corps had no discharge for disability on account of injury.

The death rate for disease was highest in the signal corps, with engineers next, and lowest in the field artillery; the death ratio for injury was highest in the ordnance, with infantry second, and lowest in the engineers.

The infantry had 14 men killed in action and 27 wounded, giving ratios per thousand of 0.60 and 1.16 respectively; hospital corps had 4 killed and 4 wounded, ratios 1.29 and 1.29; cavalry, 1 killed and 9 wounded, ratios 0.09 and 0.77; signal corps, 1 killed; engineer corps, 1 killed; field artillery, 2 wounded. The hospital corps, a so-called noncombatant branch of the service, led all others in the number of killed and wounded per thousand of strength.

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[a] American officers of Philippine Scouts and the Porto Rican regiment are included in the following statements.

## COMPARISON WITH FOREIGN ARMIES.

In the following tables[a] a comparison is made of all the data available from the annexes to the annual reports of the medical departments of the respective countries containing the international tables[a] agreed upon. Unfortunately the figures are not really comparable. In the United States the admissions include all soldiers who are excused from any part of their military duties, while this is not the case in any other country; that portion of the army serving outside the geographical limits of the United States is also included, while this is not the case with any other country except Great Britain. Again, the recruiting conditions vary greatly in each country; the United States and Great Britain rely on voluntary enlistment, while the other countries have conscription; Germany has a much larger number of men to select from than France, and there are other differences of equal importance. The strength is differently estimated in different countries. Some have a low death rate because their sick are promptly discharged or retired and die out of service instead of on sick report. Deaths and discharges considered together would form one of the most reliable bases of comparison, and international agreement has provided for their publication in the annexes referred to, but the British tables are the only foreign tables thus far received which contain data with regard to discharge.

From the tables[a] it will be seen that the highest admission rate was 1,354.89 in the American Army, and the lowest, 351.30, in the Russian; the highest death ratio was 6.75 in the American Army, and the lowest, 2.10, in the Prussian; the highest noneffective rate was 49.80, American, and the lowest 24.65, Prussian.

Of the 35 diseases shown in the following table[a] the only ones in which the admission figures for American troops are better than those of most other countries are bronchitis (acute), diphtheria and croup, erysipelas, pleuritis, scarlatina, and diseases of the ear.

The very high proportion for alcoholism in the American Army as compared with that of the British is partly due to the fact that in the latter service only admissions to hospital are counted. It is notable that while the British have less than half the American admission rate for dysentery, their death rate is practically the same, and that while their ratio of admission for malaria is about the same, their death rate is nearly three times as great; the American admission rate for malaria is nearly eighty times that of the French, while the death rate is only five times as great; these facts point to difference in the method of computing admissions. The figures for measles and mumps compare very unfavorably with other armies except the French.

The comparatively high American death rate for tuberculosis is explained by the fact that in the United States Army tuberculosis patients are sent to a sanatorium and retained in service for long periods, while in other armies they are promptly discharged; the high admission rate is no doubt due to the present defective system of medical examination of recruits.

The undue prevalence of typhoid fever in the Army is partly explainable by its undue prevalence in the civil communities where the troops are stationed, as a result of the general failure to purify water and sewage in American municipalities.

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[a] Omitted.

Notable is the absence of smallpox in the Prussian, Bavarian, and Dutch armies; more care in vaccination would give like results in other services.

## RECRUITING.

There has continued to be much complaint of the poor quality of recruits received at posts, and that these complaints were generally well founded is shown by the large number of men discharged a short time after enlistment for disabilities existing at enlistment. The reestablishment of the recruiting depots where recruits will be kept for some time under the observation of experienced medical officers before being sent to regiments will do much to obviate the difficulty resulting from the employment of inexperienced civil medical men for the examination of recruits at recruiting stations. Satisfactory results can, however, never be attained until the medical examination of recruits is in the hands of experienced military medical officers. As the size of the Medical Corps is too small to permit of details at the many recruiting stations, it was recommended that the medical examination of recruits at these stations be entirely done away with, and that recruits at each station be accepted conditionally on the judgment of the recruiting officer and at once sent to a depot for medical examination by a board of medical officers. The plan will probably also result not only in saving the expense of hiring civilian physicians, but in a great gain in efficiency in the improved physical character of recruits accepted.

The following table shows the number of applicants for enlistment, white and colored, examined physically during the year 1904, with the number accepted, rejected on primary examination, and declined, with ratios per thousand:

TABLE A.

| | White. | | Colored. | |
|---|---|---|---|---|
| | Number. | Ratio per 1,000 examined. | Number. | Ratio per 1,000 examined. |
| Examined | 48,497 | 1,000.00 | 1,914 | 1,000.00 |
| Accepted | 31,927 | 658.33 | 1,274 | 665.60 |
| Rejected on primary examination | 12,483 | 257.40 | 527 | 275.36 |
| Declined | 4,087 | 84.27 | 113 | 59.04 |

The number of recruits, white and colored, examined for enlistment during the year was: White, 48,497; colored, 1,914; total, 50,411. Strictly speaking these figures do not represent actual recruits, all reenlistments being included. The large increase over the number examined last year was due to the expiration of the term of service of those who enlisted on the reorganization of the Army in 1901.

The ratios for men accepted was for white, 658.33; colored, 665.60 per thousand, as compared with white, 619.93, and colored, 636.50, the corresponding rates for last year. A very large proportion of recruits are rejected by recruiting officers without ever being submitted to the medical examiner, so that the actual proportion accepted of all who applied for enlistment was probably less than half of what the above figures would indicate.

In the next table is shown the nativity of recruits, of whom less than 14 per cent were of foreign birth, the largest number of foreigners being from Germany, with Ireland next. This has been the case for the past decade. The proportion of men enlisted who were born in foreign countries has not materially changed during the last five years:

TABLE B.

| | White. | | Colored. | | Total. | |
|---|---|---|---|---|---|---|
| | Number. | Ratio. | Number. | Ratio. | Number. | Ratio. |
| United States (continental) | 27,447 | 859.68 | 1,268 | 995.29 | 28,715 | 864.88 |
| Germany | 1,081 | 33.86 | 1 | .78 | 1,082 | 32.59 |
| Ireland | 889 | 27.89 | | | 889 | 26.78 |
| Canada | 546 | 17.10 | 2 | 1.57 | 548 | 16.51 |
| England | 499 | 15.63 | | | 499 | 15.03 |
| Scandinavia | 425 | 13.31 | | | 425 | 12.80 |
| Russia | 244 | 7.64 | | | 244 | 7.35 |
| Austria | 242 | 7.58 | | | 242 | 7.29 |
| Scotland | 108 | 3.38 | | | 108 | 3.25 |
| Denmark | 108 | 3.38 | | | 108 | 3.25 |
| Switzerland | 66 | 2.07 | | | 66 | 1.99 |
| Italy | 63 | 1.97 | | | 63 | 1.90 |
| France | 57 | 1.79 | | | 57 | 1.72 |
| Holland | 41 | 1.28 | | | 41 | 1.23 |
| Hungary | 41 | 1.28 | | | 41 | 1.23 |
| Spain | 16 | .50 | | | 16 | .48 |
| Cuba | 8 | .25 | | | 8 | .24 |
| Others | 46 | 1.44 | 3 | 2.36 | 49 | 1.48 |
| Total foreign | 4,480 | 140.32 | 6 | 4.71 | 4,486 | 135.12 |
| Grand total | 31,927 | 1,000.00 | 1,274 | 1,000.00 | 33,201 | 1,000.00 |

This year, for the first time since the Spanish-American war, it has been practicable to compile the statistics necessary to show the interesting series of anthropometric data at various ages of the accepted recruits of the Army.

The following tables[a] have been carefully prepared and are exceedingly interesting as showing the state of physical development of the material of which our Army is composed.

The ages of all accepted recruits, white and colored, and the proportion at each age per thousand are shown in this statement:

TABLE C.

| Ages. | White. | | Colored. | |
|---|---|---|---|---|
| | Number. | Ratio. | Number. | Ratio. |
| 18 years and under | 20 | 0.6 | 1 | 0.8 |
| 19 years | 26 | .8 | | |
| 20 years | 30 | .9 | | |
| 21 years | 4,260 | 133.4 | 96 | 75.3 |
| 22 years | 6,621 | 207.4 | 202 | 158.6 |
| 23 years | 3,282 | 102.8 | 98 | 76.9 |
| 24 years | 3,054 | 95.7 | 124 | 97.3 |
| 25 years | 2,578 | 80.7 | 133 | 104.4 |
| 26 years | 1,929 | 60.4 | 102 | 80.1 |
| 27 years | 1,801 | 56.4 | 105 | 82.4 |
| 28 years | 1,530 | 47.9 | 72 | 56.5 |
| 29 years | 1,111 | 34.8 | 50 | 39.2 |
| 30 years | 899 | 28.2 | 39 | 30.6 |
| 31 years | 679 | 21.3 | 29 | 22.8 |
| 32 years | 679 | 21.3 | 28 | 22.0 |
| 33 years | 567 | 17.8 | 21 | 16.5 |
| 34 years | 531 | 16.6 | 24 | 18.8 |
| 35 years | 405 | 12.7 | 21 | 16.5 |
| 36 years | 231 | 7.2 | 11 | 8.6 |
| 37 years | 245 | 7.7 | 10 | 7.8 |
| 38 years | 215 | 6.7 | 13 | 10.2 |
| 39 years | 169 | 5.3 | 12 | 9.4 |
| 40 years and over | 1,065 | 33.4 | 83 | 65.1 |
| Total | 31,927 | 1,000.0 | 1,274 | 1,000.0 |

It will be seen from the above tabulation that our Army is essentially an army of young men. The proportion of accepted recruits of 24 years of age and under was for white 54.2 per cent, and for colored 40.9 per cent. Of the 33,201 white and colored enlistments during the year only 46 whites and 1 negro were under 20 years of age, while the age at which the largest number of recruits was accepted was for both white and colored 22 years.

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[a] Omitted, except Table C.

The height of 17.3 per cent of approved white recruits was 5 feet 7 inches, this being the highest proportion at any one height, and almost exactly the same for the colored recruits. The proportion of white and colored recruits accepted under 5 feet 4 inches was only 0.71 per cent for each class, while for those 6 feet and over 4.1 per cent and 3.5 per cent, respectively, was recorded.

The figures for the white and colored recruits at all ages are again closely assimilated, the weights of the highest proportion of accepted applicants of each class were between 140 and 149 pounds, the proportions being 26.6 per cent and 28.3 per cent for the white and colored men, respectively.

A chest measurement of 33 inches was noted among the highest proportions of both white and colored recruits at all ages accepted during the year. The proportions were 24.1 per cent and 28.3 per cent, respectively.

The following table shows the causes of rejections among white and colored candidates examined for enlistment during the year 1904, with ratios per thousand rejected:

| | White. | | Colored. | | Total. | |
|---|---|---|---|---|---|---|
| | Number rejected. | Ratio per 1,000. | Number rejected. | Ratio per 1,000. | Number rejected. | Ratio per 1,000. |
| Venereal diseases | 1,254 | 100.46 | 90 | 170.78 | 1,344 | 103.31 |
| Heart disease | 1,184 | 94.85 | 36 | 68.31 | 1,220 | 93.77 |
| Defects of vision | 1,153 | 92.37 | 26 | 49.33 | 1,179 | 90.62 |
| Varicocele | 893 | 71.54 | 29 | 55.03 | 922 | 70.87 |
| Hernia | 698 | 55.92 | 34 | 64.51 | 732 | 56.27 |
| Varicose veins | 502 | 40.22 | 7 | 13.28 | 509 | 39.12 |
| Diseases of digestive system, except hernia | 485 | 38.85 | 4 | 7.59 | 489 | 37.59 |
| Under weight | 454 | 36.37 | 11 | 20.87 | 465 | 35.75 |
| Hemorrhoids | 451 | 36.13 | 12 | 22.77 | 463 | 35.59 |
| Chest development, insufficient | 363 | 29.08 | 20 | 37.95 | 383 | 29.44 |
| Diseases of organs of locomotion, except spinal curvature | 362 | 29.00 | 17 | 32.26 | 379 | 29.13 |
| Skin diseases | 342 | 27.40 | 11 | 20.87 | 353 | 27.13 |
| Physical debility | 283 | 22.67 | 5 | 9.49 | 288 | 22.14 |
| Curvature of spine | 241 | 19.31 | 11 | 20.87 | 252 | 19.37 |
| Diseases of genito-urinary system (non-venereal) | 232 | 18.59 | 10 | 18.98 | 242 | 18.60 |
| Defects of development, except as shown in detail | 224 | 17.94 | 8 | 15.18 | 232 | 17.83 |
| Injuries | 196 | 15.70 | 7 | 13.28 | 203 | 15.60 |
| Diseases of respiratory system, except tuberculosis | 191 | 15.30 | 12 | 22.77 | 203 | 15.60 |
| Under height | 155 | 12.42 | 6 | 11.39 | 161 | 12.38 |
| Defects of hearing | 148 | 11.86 | 2 | 3.80 | 150 | 11.53 |
| Tuberculosis | 142 | 11.38 | 8 | 15.18 | 150 | 11.53 |
| Flat feet | 136 | 10.89 | 10 | 18.98 | 146 | 11.22 |
| Diseases of the eye, except defects of vision | 73 | 5.85 | 2 | 3.80 | 75 | 5.76 |
| Diseases of the circulatory system, except as shown in detail | 72 | 5.77 | 15 | 28.47 | 87 | 6.69 |
| General diseases, except epidemic | 41 | 3.28 | ........ | ........ | 41 | 3.15 |
| Diseases of the nervous system, except weakness of mind | 36 | 2.88 | 1 | 1.90 | 37 | 2.84 |
| Weakness of mind | 27 | 2.16 | 1 | 1.90 | 28 | 2.15 |
| Epidemic diseases | 23 | 1.84 | ........ | ........ | 23 | 1.77 |
| Over weight and obesity | 20 | 1.60 | 2 | 3.80 | 22 | 1.69 |
| Diseases of the ear, except defects of hearing | 19 | 1.52 | ........ | ........ | 19 | 1.46 |
| Over height (cavalry and field artillery) | 2 | .16 | 3 | 5.69 | 5 | .38 |
| Causes not physical | 2,081 | 166.71 | 127 | 240.99 | 2,208 | 169.72 |
| Total | 12,483 | 1,000.00 | 527 | 1,000.00 | 13,010 | 1,000.00 |

The principal causes of rejection, ratios per thousand, in the order of their importance were, for whites: defects of development, 120.08; venereal diseases, 100.46; heart disease, 94.85; defects of vision, 92.37; varicocele, 71.54; colored: venereal diseases, 170.78; defects of development, 98.68; heart disease, 68.31; hernia, 64.51; varicocele, 55.03.

Varicose veins, diseases of the digestive system, and defective hearing appeared much more common among white recruits, while venereal diseases, diseases of the circulatory system, and obesity were far more frequent in the negro.

The number of rejections for varicocele (922) was very large in both races and it is very questionable whether a large number of desirable recruits are not thus lost to the service. This affection is very common among men of the finest physique and most of them are unaware that they have the disease.

### KILLED AND WOUNDED IN ACTION.

Twenty-one enlisted men were killed in action and 42 wounded. Of the 21 killed, in 13 cases the bodies were not recovered in time to determine the nature of the wound; of the remainder, 6 were killed by cutting arms and only 2 by gunshot. Of the 42 wounded, 28 were by gunshot and 14 by cutting arms; 3 died and 3 were discharged subsequently for disability, the result of the wounds. Three officers were killed in action and 6 wounded.

### SURGICAL OPERATIONS.

The number and character of surgical operations performed by medical officers during the year and the results obtained by them show that the Army possesses a large proportion of surgeons of a high order of ability. A reference to the table[a] will give an idea of the imporance of the work.

The table does not include a large number of minor operations nor those done for battle wounds and the operations performed at the United States Soldiers' Home, Washington, D. C.

Of the 44 deaths reported following operation only 2 could be attributed to the operation; one of these died of shock following operation for removal of carcinoma of neck, and the other died from the anesthetic (ether). Another case died on the table from shock, but the shock was the result of the condition, rupture of the bladder, for which the operation was done. Eleven of the deaths occurred in 143 operations for appendicitis and 6 more in 22 operations for abscess of the liver.

It is interesting to note the increasing frequency with which chloroform is used as compared with ether; the former was used 835 times with no fatality, and the latter 878 times with 1 death.

### ULTIMATE RESULTS OF OPERATIONS.

With a view to determining the permanent value of operative procedures, especially those for the radical cure of hernia, a circular was issued September 30, 1904, requesting medical officers to report all cases of recurrence of hernia, or other important results following operations, which might come under their observation. In compliance with this request the following cases have been reported to the end of the year:

---

[a] Omitted.

| | | |
|---|---|---|
| Recurrence of hernia after operation for radical cure | | 3 |
| Six months after operation | 1 | |
| One year after operation, second recurrence | 1 | |
| Four years after operation, double hernia, double recurrence | 1 | |
| Recurrence of varicocele one year after high operation (second operation) | | 1 |
| Hernia after operation for appendicitis | | 1 |
| Chronic orchitis and hydrocele, result of operation for hernia | | 1 |

In course of time these reports will throw much light upon this interesting subject. As some 591 successful operations for the radical cure of hernia in officers and enlisted men have been performed by medical officers of the Army during the five years ending December 31, 1903, this makes an excellent showing as to the permanency of the operation.

## SANITATION.

*Public buildings and grounds.*—Overcrowding, particularly of guardhouses, continues to be reported from a number of posts; this is due to the fact that both companies and garrisons are larger than they used to be, and the condition will be gradually corrected as new and enlarged buildings are completed. Notable instances of overcrowding were reported from Fort Leavenworth, Kans., where in October there were 140 prisoners in the guardhouse, each man having only 13 feet of floor space and 150 cubic feet air space, this degree of overcrowding being positively dangerous to health; and from Jefferson Barracks, Mo., where in January there were 274 recruits at post while the capacity of the barracks is only 180.

The buildings at some of the older posts are reported old and dilapidated; these posts, however, are being gradually eliminated as new construction progresses. At a number of posts complaint is made of the insanitary condition of quarters occupied by married enlisted men; in some instances these have been mere shacks erected without official sanction, and by absence of suitable arrangements for disposal of excreta and wastes threatening the health of the rest of the garrison. Construction of this sort should be absolutely forbidden, and all such structures destroyed as they become vacant.

Defective ventilation resulting in tonsillitis and other catarrhal affections was reported from Fort Keogh, Mont., Fort Niobrara, Nebr., and other posts.

Several medical officers report that the garrison of their posts has outgrown the hospital capacity, a condition which is being remedied as fast as the appropriations allow, by new or additional construction.

*Drainage, sewerage, and disposal of wastes.*—Drainage in 124 posts reported upon is as follows:

| | |
|---|---|
| By surface drains | 103 |
| By combined sewers | 16 |
| By separate sewers | 5 |

Surface drainage is generally satisfactory, but at a few posts complaint was made of insanitary pools of standing water in which mosquitoes breed. This was the case at Fort Du Pont, Del., Fort Niobrara, Nebr., Fort Screven, Ga., Fort Caswell, N. C., and other posts.

The reports from 121 posts show the following methods of disposal of excreta:

| | |
|---|---|
| By water carriage | 114 |
| By dry-earth closets | 4 |
| By cesspools | 2 |
| By pits | 1 |

Fort Washakie, Wyo., is the only permanent post where the pit system still survives notwithstanding efforts to get rid of it, more or less persistent, for the last twenty years. Earth closets continue in use at Forts Clark and McIntosh, Tex., Whipple Barracks, Ariz., and for the enlisted men at Fort Walla Walla, Wash. Cesspools are in use at Jackson Barracks and Fort St. Philip, La.

A combined latrine and incinerator or cremator for the destruction of excreta was erected at Fort Myer, Va., during the year and given a trial, but proved a failure.

The ultimate disposal of sewage is:

| | |
|---|---|
| Into streams | 108 |
| Upon lowlands | 4 |
| Irrigation | 2 |

Irrigation is employed at Fort Bayard, N. Mex., and Fort Logan, Colo. The sewage emptying into streams is first purified by the use of septic tanks at four posts—Forts Des Moines, Iowa; Oglethorpe, Ga.; Leavenworth, Kans., and Bliss, Tex. At none of these posts has the system been in operation long, but thus far it has given satisfactory results.

Other wastes are variously disposed of:

| | |
|---|---|
| Dumped into streams or the sea | 40 |
| Burned in crematories | 25 |
| Burned otherwise | 12 |
| Dumped on ground at a distance | 14 |
| Hauled away | 20 |
| Various | 13 |

In the maneuver camps of the year the excreta was deposited in pits which were burned out once or twice a day by placing straw, sawdust, or other combustible material in them and saturating the whole with petroleum; the results were not altogether satisfactory.

*Water supply.*—(*a*) Source (125 posts):

| | |
|---|---|
| River (in whole or in part) | 48 |
| Artesian wells (in whole or in part) | 25 |
| Springs (in whole or in part) | 19 |
| Rain water, cisterns (in whole or in part) | 8 |
| Driven wells (in whole or in part) | 10 |
| Lake (in whole or in part) | 7 |
| Dug wells (in whole or in part) | 8 |

Cisterns for rain water are still depended upon at Fort Flagler, Wash.; Rock Island Arsenal, Ill.; Fort Caswell, N. C.; Fort Moultrie, S. C.; Fort Dade, Fort De Soto, and Key West, Barracks, Fla., and Jackson Barracks, La., while dug wells are in use at Vancouver Barracks and Fort Casey, Wash.; Presidio of San Francisco, Cal.; Fort Apache, Ariz.; United States Army General Hospital, Fort Bayard, N. Mex.; Forts Bliss and McIntosh, Tex., and Fort Morgan, Ala.

(*b*) Purification:

| | |
|---|---|
| Not purified | 85 |
| Purified | 40 |

| | | |
|---|---|---|
| By general methods | | 22 |
| Slow filtration | 7 | |
| Rapid filtration | 7 | |
| Sedimentation | 1 | |
| Distilled | 7 | |
| By local methods | | 16 |
| Portable filters | 7 | |
| Boiled | 5 | |
| Forbes sterilizers | 4 | |

The local or individual method of purifying water is never suitable or safe and should always be considered a temporary expedient.

Rapid filtration is in use at the following posts: Watervliet Arsenal, N. Y.; Jefferson Barracks, Mo.; Jackson Barracks, La.; Fort Howard, Md.; Fort Baker and Presidio of San Francisco, Cal., and Fort Myer, Va. This method has been found very satisfactory.

The water used for drinking is distilled at 7 posts. At Forts Clark, Brown, and Ringgold, Tex.; Morgan, Ala., and St. Philip, La., the water is obtained from the ice plant. At Fort Monroe, Va., and Fort H. G. Wright, N. Y., a special plant furnishes distilled water.

A softening plant is in use at Fort Lincoln, N. Dak., which employs the Clarke process, combined with the use of carbonate of soda, and gives excellent results.

Portable filters are in use at several posts, but are objectionable for the military service because soldiers will not give them the degree of care necessary to prevent them from becoming culture beds for bacteria.

(*c*) Quantity: Reported sufficient except at 6 posts. There has been considerable difficulty in obtaining an adequate water supply at many of the new seacoast fortifications. At 6 of such posts the potable water is still delivered by boat. Such is the method at Fort Constitution, N. H.; Fort Greble, R. I.; Fort Wood, N. Y., and Forts Flagler and Casey, Wash. At some of these posts arrangements are progressing which it is believed will result in securing a satisfactory solution of the difficulty. It is thought that distilling plants will be the most available plan at some of the isolated island posts.

(*d*) Quality: Reported satisfactory, except at 17 posts.

*Clothing.*—The clothing of the men, as judged from the absence of any unfavorable criticism in the sanitary reports, has been satisfactory during the year.

*Habits of the men.*—Under this heading reference is constantly made to the increasing prevalence of venereal diseases; this subject is discussed under that heading.

*Food supply and its preparation.*—The complaints under this head have been usually of temporary conditions, which were remedied promptly.

*Distribution of mosquitoes.*—The mosquito research was commenced rather late in the season, but may be considered approximately accurate. Some variety of mosquito at some season was reported from all posts except 25. Of the fortunate exceptions, 10 were in the State of California, 4 in the State of Washington, and 3 in Arizona.

*Stegomyia fasciata*, the yellow-fever mosquito, was reported from 9 posts in the United States—Forts Brown, McIntosh, Ringgold, and Sam Houston, Tex.; Barrancas and Key West Barracks, Fla.; Army and Navy General Hospital, Hot Springs, Ark.; Augusta Arsenal, Ga., and Fort Totten, N. Y.

Anopheles were reported present at 39 posts in the United States.

A large number of posts reported the varieties of mosquitoes undetermined. It is hoped to have this point definitely determined next season, as it is a matter of most importance, having a practical bearing on the local prevalence of certain important diseases and the measures to be taken for their prevention.

### UNITED STATES (CONTINENTAL) EXCLUSIVE OF ALASKA.

The average mean enlisted strength of the troops serving in the United States during the year was 43,940, of which 40,819 were white and 3,121 were colored; none of the colored troops served outside the limits of the United States proper.

The discharge for disability, total loss, and constant noneffective rates, 31.04, 37.48, and 46.32, respectively, compare very favorably with the corresponding ratios for 1903, 35.44, 41.38, and 48.49, while the admission and death rates, 1,305.83 and 6.44, were slightly higher than the figures, 1,206.89 and 5.94, for last year. The increased admission rate was due to the fact that admissions this year represent all admissions, while heretofore they have represented cases. The slight increase in the death rate was due to injuries, the death figure from disease being lower than last year.

Ten of the deaths and 58 of the discharges in the United States occurred among soldiers whose commands were in the Philippines and who had been invalided home from there; deducting these deaths and discharges the revised rates would be 6.21 and 29.72, respectively. Even these figures do not show the full effect of Philippine service upon the rates in the United States, for many soldiers die and many are discharged at later periods as direct results of that service whose cases it is impossible to follow.

Disease caused the discharge for disability of 27.77 per thousand of strength of troops serving in the United States and a total loss of but 31.71 during the year, which is a decided improvement over 36.82, the corresponding figure for the previous year. The death rate dropped 0.18 per thousand, while the admission rate was slightly in excess of that for the calendar year 1903. Those constantly noneffective from disease during the year numbered 39.11 per thousand of strength.

The admission, discharge, and death rates from external causes were slightly in excess of the corresponding ratios for the previous year.

In the United States, as in the whole Army, venereal diseases led all others as a cause of admission, discharge, and noneffectiveness, the rates being 163.42, 5.03, and 9.83, all considerably higher than for 1903. Tonsillitis was second, diarrheal diseases third, bronchitis fourth, and influenza fifth. Malarial fevers have sixth place, with a rate of 49.16, as against 60.83 for 1903. As a cause of death pneumonia stood first, with a rate of 0.82, nearly twice as great as that for 1903. This increase in the death rate for pneumonia was shared by the civilian population, among whom also the disease was unusually prevalent. After pneumonia followed, in regular order, tuberculosis, rate 0.68; measles, rate 0.32; typhoid fever, rate 0.27; and alcoholism, rate 0.25.

A study of the causes of death, as exhibited in the following table,[a] shows that 61.13 per cent of all deaths were due to disease and 38.87 per cent to external causes. Of the deaths from disease 20.80 per cent were due to pneumonia, 15.60 per cent to tuberculosis of the lungs, 8.09 per cent to measles, and 6.93 per cent to typhoid fever;

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[a] Omitted.

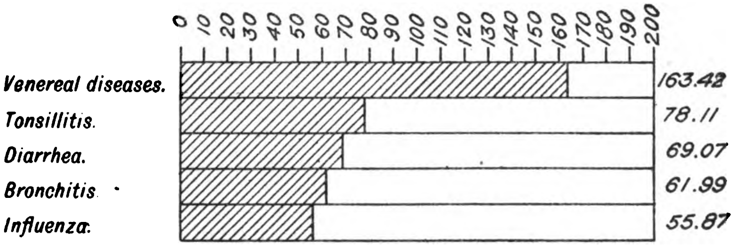
these four diseases alone, all preventable, causing over 50 per cent of the total mortality.

Of the deaths from external causes, 20 per cent were suicidal, 18.18 per cent accidental drowning, and 12.72 per cent wood-alcohol poisoning, the three causes accounting for over 50 per cent of the deaths.

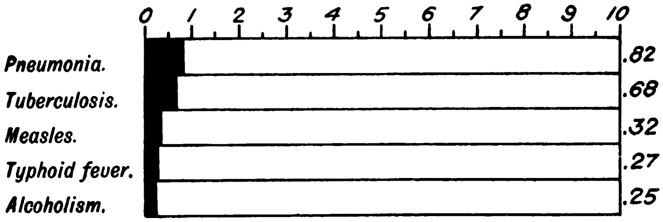
After venereal diseases as causes of discharge for disability, followed in regular order, tuberculosis, rate 2.46; insanity, rate 1.98; organic diseases of the heart, rate 1.82, and epilepsy, rate 1.23.

*Charts showing the relative admission, death, discharge and noneffective rates for the five diseases causing the highest rates in the United States.*

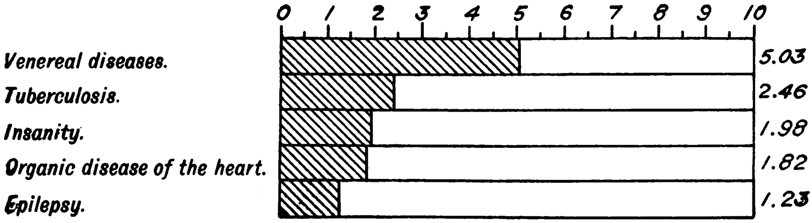
Admissions.



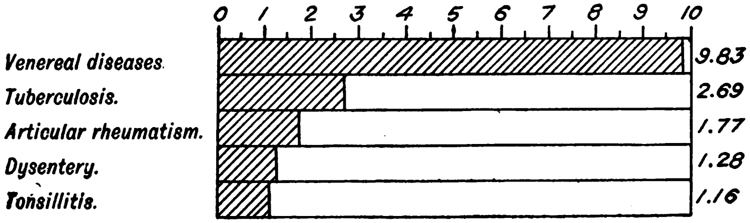
Deaths.



Discharges.



Noneffective.



## TYPHOID FEVER.

There were last year 247 admissions for typhoid fever, with 12 deaths, a case mortality of about 5 per cent. The admission rate was 5.62, as against 5.82 for 1903, a gratifying decrease, especially when taken in connection with a corresponding decrease in malarial fevers and fevers undetermined. Cases of typhoid fever were reported from 52 different posts, 6 hospitals in the field, and 2 general hospitals.

Fort Leavenworth again held the record for the largest number of cases (53), with Camp George H. Thomas second. At Leavenworth, as explained in the last annual report, the cause of the epidemic was the use of a water supply polluted by the sewage of the post. A sewage purification plant went into operation in December, 1904, and the water supply was changed January, 1905; since that time and up to May 31, 1905, not a single case of typhoid fever had occurred at Leavenworth. At Camp George H. Thomas the continued prevalence of the disease was attributed to the use of infected water from unauthorized sources. In October, 1904, the command went into permanent barracks at the new post, Fort Oglethorpe, since which time there has been a steady decrease in typhoid fever.

An outbreak of typhoid fever which occurred at Fort Dade, Fla., appears to have been a place or contact infection. Major Mason who visited the post and investigated the outbreak reported as follows:

> There had been no case of typhoid fever at this post since its establishment until December 29, 1902, when three cases were admitted to hospital, these being the first cases of an epidemic which lasted until the 25th of the following February and reached a total of 17 certain and 12 probable cases of typhoid fever, with 1 death from that cause. The strength of the command during this period was about 115 men. No other case occurred until March 11, 1904, when a schoolboy attending school in Tampa was admitted to hospital with typhoid fever; this is the only case which has ever occurred at the post except among the enlisted men, and this case was brought to the post while ill with the fever.
>
> The next case was in an enlisted man admitted to hospital October 17, 1904, and returned to duty December 5. On December 12, 3 cases were admitted, on December 13, 2 cases, on December 14, 16, and 17, 1 case each; then, after an interval of ten days, 2 more cases were admitted on December 27; after this there was another interval of thirteen days followed by the admission of 1 case January 9, the day of my arrival at post. Seven of these cases gave a positive reaction, and 2 a partial reaction to the Widal test; the rest were negative. Besides these 11 cases, 10 others were admitted during the same period with a diagnosis of dengue; the fever in these cases lasted one to two weeks, and some, if not all of them, were probably typhoid fever, although only one gave a positive reaction to the Widal test. The strength of the command during this period has been about 95 men.
>
> Except the first sergeant none of the men of the command has served in the Tropics. No anopheles mosquitoes have ever been found at post, and it is said that no case of malaria has ever originated here; 3 cases of malaria are found on the register in 1902, and none since that date. Though the symptoms of malaria were entirely absent in the present series of cases, the blood of 10 patients was examined for the malarial organism with a negative result; quinin in large doses was also used in each case without any effect on the fever.
>
> All of the men of this command, with the exception of the hospital corps and noncommissioned staff, belong to the one hundred and eleventh company coast artillery, and all the cases were among the enlisted men of this company. The company is quartered in 2 one-story barracks of 2 squad rooms each; the squad rooms are light, well ventilated, and roomy, each bed having over 100 feet of floor space and 1,000 cubic feet of air space.
>
> The water supply of the post is from two sources. The drinking water is from rain-water cisterns, covered with a roof and protected by wire gauze from access of mosquitoes; the cisterns are of wood raised some 2 feet above the ground, and with a faucet near the bottom to draw off the water. The tanks are cleaned about once a year, in the late summer. The water for all other purposes is from a series of 6 shallow wells about 9 feet deep, walled with brick, with cement coping, and tight-fitting iron cover. These wells are connected and the water pumped into an elevated

tank holding 60,000 gallons. The well water is hard, brackish, and slightly sulphuretted. The use of the water for drinking is forbidden, but a number of the patients admit having used it, while others positively deny such use. The level of the ground water is 3 to 5 feet below surface and is said to vary with the rains but not with the tides; it is lowest at this season.

The post has a well-constructed sewer system which discharges into the sea on the side of the island opposite the wells. All the dwellings on the island are not, however, connected with the sewer.

Living in the post are some twenty men employed in construction of buildings; these men live in shacks, have their own mess, and use very crude earth closets, most of the excreta and slops going on the ground; their mess room and kitchen are unprotected from flies, and the whole surroundings are in a very unsanitary condition; the same remark applies to the shack occupied by the hospital matron.

On the island there is also a light-house and a pilot station, the buildings of which have no sewer connection. At the north end of the island there are a number of shacks used by laborers working on the fortifications under an officer of the engineer corps; these buildings also have no sewer connection and no cistern water; they and their surroundings are in a most unsanitary condition.

The man in charge of the pump house lives near the wells and has an earth closet about 200 feet from the nearest well. It is fair, however, to state that after careful inquiry I have been unable to ascertain that there has ever been an even possible case of typhoid fever among any of the residents of the island except the enlisted men.

The only milk used at the post is of the tinned variety. No raw vegetables, except cabbage and celery brought from the north, have been used by the men at post; neither have raw oysters nor soft drinks been obtainable by them here.

The men of the command occasionally visit Tampa where there is always some typhoid fever, but none of the typhoid fever cases had visited that city for a period longer than the incubation period of that disease. The men from Fort De Soto, 1½ miles distant, living under almost exactly the same conditions, visit Tampa with equal frequency, but there has been no case of typhoid fever at that post for over two years, and for several weeks past there has been no case of any sort on sick report.

During the epidemic of typhoid fever at this post in 1902–3, squad room No. 2 of barracks No. 1, was used as a typhoid-fever ward to take the overflow from the hospital; cases occurred in all the squad rooms. It is stated that the squad room used as a typhoid fever ward was disinfected after its use as such, though from the best evidence obtainable, this disinfection was not very thorough; the other squad rooms and the beds, bedding, and clothing of the patients taken from them were not disinfected. Since June last more than half of the enlisted men of this company have been discharged, and to-day there are only 18 men at the post who were here in the outbreak of 1902–3; of these 18, 6 were ill at that time, 4 with certain and 2 with probable typhoid fever; of these 6 only 1 has been sick this time, and dengue was the diagnosis in his case; his blood was negative to the Widal test. In June some 16 recruits were received at post and in October about 40 more. Private W., the first man to develop typhoid fever, belonged to the June recruits.

Such are the facts. My conclusions from them are that the disease was contracted and spread through infected barracks and bedding. In the previous outbreak, 1902–3, all the susceptible material was exhausted; the dormitories (except that used as a fever ward) and bedding were not disinfected; in June and October a large amount of combustible material in the shape of young recruits arrived at the post; upon the advent of cold weather the barracks were kept more closed and the men stayed in them more; at this time, too, the work of tearing down and repairing inside chimneys was commenced, raising much dust in quarters. The disease once started was probably aided in its spread by the fresh infection carried from man to man on persons, bedding, and clothing.

Infection in Tampa may be excluded by the fact that a command of equal size at Fort De Soto equally exposed has had no sickness whatever; this certainly points to a local infection.

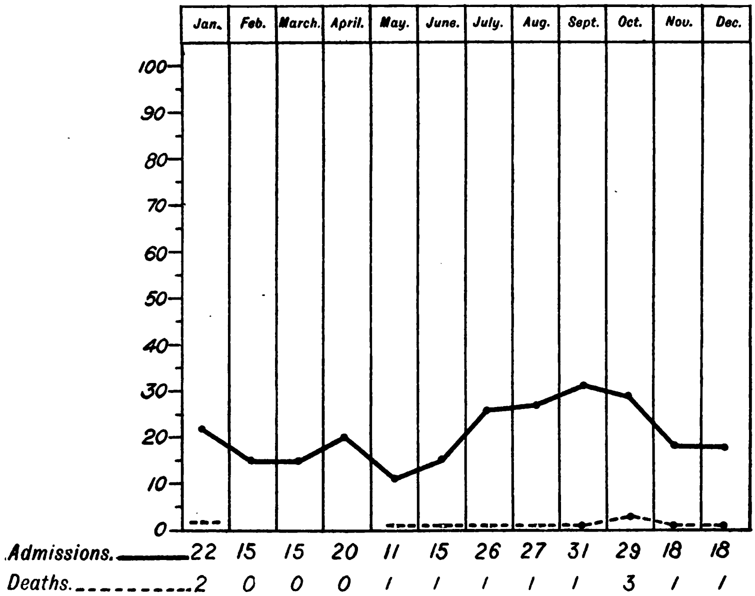
That the water was not the source of infection is indicated by the fact that this water is used by an almost equal number of civilians, many of them living under the most unsanitary conditions, and not one of them has had the disease. No one at the post, living outside of the barracks has had the disease. The ice is brought from Tampa and is used also by all other residents of the post and by the command at Fort De Soto; it is said to be made from distilled water. Milk, oysters, and uncooked vegetables may be excluded as sources of infection because none of them have been used with the exception of cabbage and celery as noted above.

Infection of food or water by dust or flies is not likely because the excreta of the men are removed by an excellent system of water carriage, closets are kept clean and flies are not at all abundant at this season.

Beds in dormitories have been carefully platted, but bed-to-bed infection has not been demonstrated; men in adjoining beds have developed typhoid fever, but nearly always on the same day; in a number of instances, however, the occurrence of cases in the same ward have been separated by the average incubation period of typhoid fever. Each dormitory has had almost exactly the same number of cases.

A rather sharp epidemic at Fort Niagara, N. Y., also appeared very much like a place infection. Of 11 cases occurring at that post in 1904, 9 were occupants of the same barrack and one more, a soldier who spent most of his time there. The garrison consisted of four companies, each company occupying a separate barrack with separate messes and the same water supply.

*Chart showing prevalence of typhoid fever in the United States (continental, exclusive of Alaska) by months.*



In view of these facts the following letter was sent to all chief surgeons:

War Department,
Office of the Surgeon-General,
*Washington, May 31, 1905.*

Sir: I am directed by the Surgeon-General to request that you call the attention of medical officers in your department to the necessity of giving careful attention to the details of disinfection in the effort to stamp out epidemics of typhoid fever. The evidence of barrack, company, and latrine infection is constantly accumulating. Whenever, therefore, a case of typhoid fever occurs in a barrack room, quarters, or tent, that room or tent, the latrine, bathroom, and wash room used by the patient, and everything else used by him should be regarded as infected, and all persons occupying the same room regarded as suspects. The patient having been removed, everything which has been infected should be thoroughly disinfected. All contacts should be kept under observation for the full period of incubation, during which time all their discharges should be disinfected and their blood tested by the Widal method at least twice a week.

Very respectfully,

Chas. F. Mason,
*Major, Surgeon, U. S. Army.*

Over two-thirds of the total admissions for typhoid fever occurred in men under 25 years of age; more than one-half in soldiers of less than one year of service, and over 81 per cent in men in their first enlistment.

The smallest number of admissions occurred in May, from which time there was a gradual increase until the maximum was reached in September; the largest number of deaths occurred in October.

The unabridged report of the Army Board on the "Origin and Spread of Typhoid Fever in United States Military Camps During the Spanish War of 1898" was published and its distribution begun about the end of the year. The report is one of the most valuable contributions to the epidemiology of that disease that has ever appeared.

### UNDETERMINED FEVERS.

Under the heading of fevers undetermined were included all those fevers the nature of which was not indicated by the diagnosis. There were 275 (rate 6.26) of such cases under 38 different diagnoses, by far the greater number, however, being included under "ephemeral fever," "febricula," and "simple continued fever," with various modifications.

Of the 275 cases, 14 had a duration of one day or less; 211, two days to a week; 27, eight days to two weeks; 20, fifteen days to three weeks, and 3 over three weeks.

This class of diseases should always be considered in connection with typhoid fever, many cases of which it no doubt includes. This year there was a gratifying reduction in the number of cases included in this group and every effort should be made to reduce the number to still smaller proportions.

### MALARIAL DISEASES.

The next table exhibits in like manner the figures for malarial diseases:

| | Admitted. | | | Discharged on surgeon's certificate of disability. | | | Died. | | | Noneffective. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. |
| Malarial intermittent fever: | | | | | | | | | | | | |
| Year 1904 | 1,852 | 58 | 1,910 | ...... | ...... | ...... | ...... | .... | ...... | 33.10 | 1.07 | 34.17 |
| Year 1903 | 2,045 | 96 | 2,141 | ...... | ...... | ...... | ...... | .... | ...... | ...... | ...... | 38.41 |
| Years 1899–1903 | ...... | ...... | 18,805 | ...... | ...... | ...... | ...... | .... | ...... | ...... | ...... | ...... |
| Malarial remittent or continued fever: | | | | | | | | | | | | |
| Year 1904 | 166 | 7 | 173 | ...... | ...... | ...... | ...... | .... | ...... | 7.23 | .54 | 7.77 |
| Year 1903 | 311 | 19 | 330 | ...... | ...... | ...... | ...... | .... | ...... | ...... | ...... | 14.89 |
| Years 1899–1903 | ...... | ...... | 2,501 | ...... | ...... | 1 | ...... | .... | 3 | ...... | ...... | ...... |
| Pernicious malarial fever: | | | | | | | | | | | | |
| Year 1904 | 1 | ...... | 1 | ...... | ...... | ...... | ...... | .... | ...... | .11 | ...... | .11 |
| Year 1903 | 3 | ...... | 3 | ...... | ...... | ...... | 2 | .... | 2 | ...... | ...... | .50 |
| Years 1899–1903 | ...... | ...... | 28 | ...... | ...... | ...... | ...... | .... | 7 | ...... | ...... | ...... |
| Malarial cachexia: | | | | | | | | | | | | |
| Year 1904 | 75 | 1 | 76 | ...... | ...... | ...... | ...... | .... | ...... | 5.67 | .09 | 5.76 |
| Year 1903 | 93 | 4 | 97 | 4 | 1 | 5 | ...... | .... | ...... | ...... | ...... | 12.09 |
| Years 1899–1903 | ...... | ...... | 1,030 | ...... | ...... | 101 | ...... | .... | 5 | ...... | ...... | ...... |
| Total malarial diseases: | | | | | | | | | | | | |
| Year 1904 | 2,094 | 66 | 2,160 | ...... | ...... | ...... | ...... | .... | ...... | 46.10 | 1.70 | 47.80 |
| Year 1903 | 2,452 | 119 | 2,571 | 4 | 1 | 5 | 2 | .... | 2 | ...... | ...... | 65.90 |
| Years 1899–1903 | ...... | ...... | 22,364 | ...... | ...... | 102 | ...... | .... | 15 | ...... | ...... | ...... |

| | Ratios per 1,000 of mean strength. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Admitted. | | | Discharged on surgeon's certificate of disability. | | | Died. | | | Noneffective. | | |
| | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. |
| Malarial intermittent fever: | | | | | | | | | | | | |
| Year 1904 | 45.37 | 18.58 | 43.47 | | | | | | | 0.81 | 0.34 | 0.78 |
| Year 1903 | 52.33 | 30.16 | 50.66 | | | | | | | | | .91 |
| Years 1899–1903 | | | 121.00 | | | | | | | | | |
| Malarial remittent or continued fever: | | | | | | | | | | | | |
| Year 1904 | 4.07 | 2.24 | 3.94 | | | | | | | .18 | .17 | .18 |
| Year 1903 | 7.96 | 5.97 | 7.81 | | | | | | | | | .35 |
| Years 1899–1903 | | | 16.09 | | | 0.006 | | | 0.02 | | | |
| Pernicious malarial fever: | | | | | | | | | | | | |
| Year 1904 | .02 | | .02 | | | | | | | .003 | | .003 |
| Year 1903 | .08 | | .07 | | | | 0.05 | | .05 | | | .01 |
| Years 1899–1903 | | | .18 | | | | | | .04 | | | |
| Malarial cachexia: | | | | | | | | | | | | |
| Year 1904 | 1.84 | .32 | 1.73 | | | | | | | .14 | .03 | .13 |
| Year 1903 | 2.38 | 1.26 | 2.30 | 0.10 | 0.31 | .12 | | | | | | .29 |
| Years 1899–1903 | | | 6.63 | | | .65 | | | .03 | | | |
| Total malarial diseases: | | | | | | | | | | | | |
| Year 1904 | 51.30 | 21.15 | 49.16 | | | | | | | 1.13 | .54 | 1.09 |
| Year 1903 | 62.75 | 37.39 | 60.83 | .10 | .31 | .12 | .05 | | .05 | | | 1.56 |
| Years 1899–1903 | | | 143.90 | | | .66 | | | .10 | | | |

Here will be noted a very gratifying improvement in all the figures over those for last year and for the quinquennial period, an improvement, the direct result of the energetic and intelligent efforts of medical officers in the direction of prevention.

The following table exhibits the improvement which has occurred at five of the more malarial posts since the period before the Spanish-American war and as compared with 1903:

| Post. | Years. | Mean strength. | Admitted. | Discharged on surgeon's certificate of disability. | Died. | Noneffective (days). | Ratios per 1,000 of mean strength. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Admitted. | Discharged on surgeon's certificate of disability. | Died. | Noneffective. |
| West Point, N. Y | 1897 | 381 | 90 | | | 367 | 236.22 | | | 2.64 |
| | 1903 | 529 | 22 | | | 104 | 41.59 | | | .54 |
| | 1904 | 466 | 6 | | | 82 | 12.88 | | | .48 |
| Fort Wadsworth, N. Y | 1897 | 194 | 28 | | | 156 | 144.33 | | | 2.20 |
| | 1903 | 375 | 10 | | | 93 | 26.67 | | | .68 |
| | 1904 | 478 | 10 | | | 109 | 20.92 | | | .62 |
| Washington Barracks, D. C | 1897 | 295 | 170 | | | 790 | 576.27 | | | 7.31 |
| | 1903 | 270 | 46 | | | 226 | 170.37 | | | 2.29 |
| | 1904 | 304 | 31 | | | 213 | 101.97 | | | 1.91 |
| Fort Myer, Va | 1897 | 281 | 151 | | | 949 | 537.37 | | | 9.25 |
| | 1903 | 573 | 34 | | 1 | 276 | 59.33 | | 1.75 | 1.32 |
| | 1904 | 592 | 18 | | | 219 | 30.41 | | | 1.01 |
| Fort Monroe, Va | 1897 | 551 | 70 | | | 403 | 127.04 | | | 2.00 |
| | 1903 | 953 | 44 | | | 528 | 46.17 | | | 1.52 |
| | 1904 | 860 | 9 | | | 111 | 10.47 | | | .35 |
| United States | 1897 | 25,417 | 2,005 | 1 | 1 | 15,162 | 78.88 | 0.04 | .04 | 1.63 |
| | 1903 | 42,264 | 2,571 | 5 | 2 | 24,053 | 60.84 | .12 | .05 | 1.56 |
| | 1904 | 43,940 | 2,160 | | | 17,496 | 49.15 | | | 1.09 |

In December Capt. J. H. Ford, assistant surgeon, U. S. Army, in a paper on "The antitoxin treatment of tertian malarial infections," reported that by inoculating rabbits with malaria, either by subjecting them to the bites of infected anopheles or by the intravenous injection of human blood in which the plasmodium malariae had been found, an antitoxin was developed in the rabbit's blood which possessed curative and immunizing powers. The experiments on which he based this conclusion are not, however, convincing nor conclusive.

### ERUPTIVE FEVERS.

Of the eruptive fevers, measles showed a large increase—17.98 for 1904 as against 9.89 for 1903; smallpox also showed a slight increase, 0.32 against 0.28; there was no death from the latter disease.

### DIARRHEAL DISEASES.

In October Musgrave and Clegg, of Manila, published a paper on Amebas, in which, while not denying that there may be pathogenic and nonpathogenic amebas, they contend that such a distinction has never been proven and that in the Tropics at least the presence of amebas in the stools is an indication for treatment.

In the annual report of the United States Army General Hospital, Presidio of San Francisco, Cal., Assistant Surgeon Craig, the pathologist of the hospital, gives the result of his extended researches upon this subject. His conclusions are as follows:

1. The intestine of man may be infected with two varieties of amebas, one pathogenic (*Entameba dysenteriæ*) and the other nonpathogenic (*Entameba coli*).
2. That *Entameba coli*, the nonpathogenic variety, is found in 65 per cent of the healthy individuals studied, and in 50 per cent of the individuals suffering from diseases other than dysentery, if a saline cathartic has been administered.
3. That these organisms can be easily distinguished in both fresh and stained specimens.
4. That they differ widely in their method of reproduction, and that this is the most important method of distinguishing them.
5. That *Entameba dysenteriæ*, whether fed in milk or injected through the rectum, produces in kittens the typical lesions of amebic dysentery as observed in man.
6. That in kittens *Entameba coli*, whether fed in milk or injected through the rectum, is absolutely harmless.
7. That neither feeding experiments nor rectal injections of fecal material or the bacteria occurring in such material produce any of the lesions of amebic dysentery unless *Entameba dysenteriæ* is present.

### LEPROSY.

The case of leprosy at Fort Screven, Ga., the progress of which has been noted in previous reports, remained practically unchanged at the end of the year. The patient claims that he feels perfectly well, but a few nodules in the skin, and ulceration in the nose show that the disease persists. X-ray treatment was discontinued November 25, 1904. Injections of leprolin were begun November 28 and continued until December 16, when the sixth injection was given; no permanent effect upon the lesions was noted as a result of the injections.

## BERIBERI.

A report by Asst. Surg. L. P. Williamson, U. S. Army, upon an outbreak of beriberi among the Filipinos at the Louisiana Purchase Exposition is interesting as being the only epidemic of this disease which has been reported in this country. There were 59 cases, with 4 deaths, among the Filipinos. No other people were affected.

The points of interest were the entire escape of 450 Filipino scouts, who were living in a model camp under the best sanitary conditions, and of 38 other Filipinos whose sanitary surroundings were good, while all the cases occurred among the remaining 788 natives, who were for some time crowded into one small building under conditions of filth, bad ventilation, and extreme overcrowding. There were in this building twelve bunks for as many people in each room 10 by 12 feet.

After the overcrowding and other unsanitary conditions were removed the disease ceased.

Food as a factor could be excluded, because all the Filipinos—those who escaped entirely, like the scouts, and those severely affected—had practically the same diet and a liberal one. A good quality of Louisiana rice was used by all.

The first case of beriberi was found among the Moros when they arrived April 30, some five weeks after leaving the Philippines. The next day 2 cases occurred among the Visayans, who had been on the ground about five weeks and absent from the Philippines about ten weeks.

For a long time there were intervals of ten days to three weeks between the development of successive cases or groups of cases, after which new cases developed almost daily.

There was strong evidence of infection of the overcrowded building referred to, inasmuch as only those natives who had lived in it contracted the disease, while nearly 500 others who had never lived there remained well. Further, the constabulary who lived in the building throughout their stay remained infected until the end, while among the natives who were removed to their own villages the epidemic soon ceased.

## EPIDEMIC CEREBROSPINAL MENINGITIS.

Eleven cases of epidemic cerebrospinal meningitis were reported with 6 deaths, 2 at Fort Slocum and 1 each at Forts Bliss, Apache, Ethan Allen, and Myer.

## SPOTTED FEVER.

On July 25 Asst. Surg. P. M. Ashburn, Fort Missoula, Mont., rendered an interesting report upon the so-called *Piroplasmosis hominis*, "tick fever", or "spotted fever" of that vicinity. Recent investigations by other physicians had seemed to show that this disease was caused by a protozoan organism resembling *Piroplasma bigeminum* constantly found in the blood of sufferers and transmitted from the gopher to the human being by means of the bite of a tick. Doctor Ashburn's work, extending over some six months and including the study of some 10 cases, many hours being devoted to the microscopic examination of the blood of patients and gophers, led him to the conclusion that no protozoan organism occurs in the blood of the patients, and that the disease has no connection with gophers or ticks. He further concludes that the disease is not cerebrospinal meningitis or typhus, both of which it resembles, especially the latter, and that its true nature is unknown.

### YELLOW FEVER; MALTA FEVER.

There was 1 case of yellow fever at Fort Brown, Tex., and 3 admissions, representing 2 cases of malta fever, at Benicia Barracks and the U. S. Army General Hospital, Presidio of San Francisco, Cal.

### TUBERCULOSIS.

During the year 1904 there were 200 admissions for all forms of tuberculosis, equivalent to an admission ratio of 4.55 per thousand, 30 deaths, equal to a rate of 0.68, and 108 discharges for disability, with a rate of 2.46. The admission rate was slightly in excess of that for 1903, 4.20, but the other rates were considerably less than for 1903, 0.86 and 4.10, respectively. The principal cause of the increased proportion of admissions was the fact that all admissions were counted this year, while last year admissions represented cases; the few discharges were due to the fact that cases are now retained at Fort Bayard much longer than formerly, before discharge, while the diminished death rate represents the net gain from the more prolonged treatment.

A study of the tuberculosis figures as shown in the following tables[a] reveals the facts that the highest admission rates occurred in soldiers between the ages of 25 and 29 years and that over three-fourths of all admissions were in men under 30 years. That more than one-fourth of all the admissions were in men of less than one year's service and more than one-half in the first enlistment indicates that sufficient care is not exercised in excluding this disease in recruits.

### VENEREAL DISEASES.

The prevalence of these diseases is steadily increasing, both the admission and noneffective rates being higher than for the last year, though the death and discharge ratios were slightly lower.

### ALCOHOLISM.

Alcoholism showed a slight decrease over last year, the admission rates being: 1904, 25.42; 1903, 26.72.

### INSANITY.

There was a decided increase in insanity, the proportion being 1.71, against 1.02 for 1903. This increase, however, was not incident to service. Of the 88 soldiers discharged for insanity in the whole Army the disease was noted as having been contracted before enlistment in 22, and probably so contracted in 11 more; 8 soldiers were discharged as insane within three months of enlistment.

### PNEUMONIA.

Pneumonia was unusually prevalent and fatal. There were 236 cases and 36 deaths, giving ratios of 5.37 and 0.82 per thousand of strength, compared with 3.69 and 0.43 for 1903.

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[a] Omitted.

The highest case mortality was noted at posts in the States of Colorado, 100 per cent (6 cases, 6 deaths); Wyoming, 50 per cent (4 cases, 2 deaths); Utah, 25 per cent (8 cases, 2 deaths), and Nebraska, 22 per cent (9 cases, 2 deaths). In the Department of the Gulf there were 6 cases with no death, and in the Department of Texas, 9 cases with 1 death.

## INTESTINAL PARASITES.

In connection with the report last year of the surgeon at Fort Porter, N. Y., Captain Hallock, upon the prevalence of intestinal worms among the men of a battalion of the First Infantry which had recently returned from service in Samar, Philippine Islands, the following extracts are published from a supplementary report by that officer dated July 30, 1904:

> The command consisted of the Third Battalion of the First Infantry and returned to the States from the Philippines in May, 1903. While in the islands they were stationed at various points in the island of Samar.
>
> As many of the patients admitted to hospital for all causes were found to harbor parasites, I thought it would be of interest to examine the entire command, and the figures below show the result of this work and include only those who have served in the islands. Nearly all of the men were on duty and had no symptoms whatever. A few had slight disturbances of digestion and irregularity of the bowels, and some of the hook-worm cases had a little anemia, but not enough to give marked symptoms or to incapacitate them for duty.
>
> No parasites were found in men who had not served outside of the United States. A number of the men were discharged by expiration of term of enlistment before the examinations were begun.
>
> In all cases reported as positive the ova or parasites were demonstrated at least three times on different days. These repeated examinations were made to avoid the possibility of error, for the men were doing duty and brought their stools to the hospital, and occasionally the names were misplaced or lost. Cases reported as negative were examined on three days, and at least a dozen slides made in all.

| | Company I. | | Company K. | | Company L. | | Company M. | |
|---|---|---|---|---|---|---|---|---|
| | Number. | Per cent. | Number. | Per cent. | Number. | Per cent. | Number. | Per cent. |
| Men examined | 54 | | 30 | | 30 | | 40 | |
| Trichocephalus dispar | 15 | 27.77 | 11 | 36.66 | 10 | 33.32 | 9 | 20.45 |
| Uncinaria duodenalis | 6 | 11.12 | 1 | 3.34 | | 3.34 | 6 | 13.63 |
| Tænia nana | 1 | 1.85 | | | | | | |
| Ascaris lumbricoides | 1 | 1.85 | | | | | 1 | 2.28 |
| Trichocephalus dispar and Uncinaria duodenalis | 14 | 25.93 | 3 | 10.00 | 6 | 20.00 | 10 | 22.72 |
| Trichocephalus dispar and Ascaris lumbricoides | 1 | 1.85 | | | 1 | 3.34 | | |
| Trichocephalus dispar, Uncinaria duodenalis, and Ascaris lumbricoides | 1 | 1.85 | 1 | 3.34 | | | | |
| Trichocephalus dispar and Tænia nana | 1 | 1.85 | | | | | | |
| Tænia nana and Uncinaria duodenalis | | | | | | | 1 | 2.28 |
| Negative | 14 | 25.93 | 14 | 46.66 | 12 | 40.00 | 17 | 38.64 |
| Number of men with parasites | 40 | 74.07 | 16 | 53.34 | 18 | 60.00 | 27 | 61.36 |
| Number of without parasites | 14 | 25.93 | 14 | 46.66 | 12 | 40.00 | 17 | 38.64 |

Of the 158 men in the battalion 101, or 63.92 per cent, harbored parasites.

The following are the blood counts in three of the more marked cases:

| | Case I—Diagnosis: Tænia nana. | Case II—Diagnosis: Uncinaria duodenalis. | Case III—Diagnosis: Trichocephalus dispar. |
|---|---|---|---|
| | *Per cent.* | *Per cent.* | *Per cent.* |
| Polymorphonuclear neutrophiles | 73.33 | 55.55 | 74.28 |
| Lymphocytes, large and small | 24.61 | 36.11 | 17.46 |
| Eosinophiles | 1.53 | 8.33 | 8.25 |

I have been unable to form any definite opinion as to the source of the infections One would naturally think of the drinking water, but the percentage of men infected in the different companies varies little, and they were stationed at many points in Samar and had many different sources of water supply.

It is well known that the Chinamen who cultivate truck gardens in the Philippine Islands collect the night soil and after mixing it with water spread it on the ground as a fertilizer. In connection with Loose's experiments with the *Ankylostoma duodenalis*, it is interesting to note that no history of ground itch could be obtained nor did the men go barefoot.

The hook worms were, as a rule, killed by thymol, but the effect was not satisfactory with less than 6 grams of the drug. This was habitually given in three doses of 2 grams each at intervals of two hours and followed by 45 grams of Epsom salts or castor oil. The diet for twenty-four hours preceding the anthelmintic consisted of strained soup only, and a saline was given about three hours before the first dose of thymol. Occasionally it was necessary to repeat the treatment after an interval of a week or ten days.

Male fern was efficient against the dwarf tapeworm, but two of the cases which were apparently cured were found to have the parasites after two months, although they were present in smaller numbers.

The round worms were all, as a rule, promptly expelled by santonin. One case, however, required 0.713 gram, and there was no toxic symptom from this dose. The drug was from a new supply and furnished by a reliable firm. In the preceding cases, with the old supply, 0.324 gram was always efficient.

I have failed to dislodge the trichocephalus. The anthelmintics which were efficient against the other worms had no effect. Colon flushes of strong saline solution, quinine, and enemata containing turpentine were also without effect. The number of ova in these cases indicated but few worms, and I was unable to detect any symptom due to their presence.

## LIVER ABSCESS.

There were 20 cases of liver abscess, with 4 deaths.

## EXTERNAL CAUSES.

There were 20 cases of poisoning by methyl alcohol, with 14 deaths, and 1 discharge for amblyopia. Of these cases 7 were at Fort Terry and 2 each at Forts H. G. Wright and Wadsworth, the remainder distributed among 7 posts. In 13 of the cases bay rum was noted as the poison taken as an intoxicant.

## INFLUENCE OF STATION.

Excluding injuries, venereal disease, and alcoholism, the Department of the Colorado had the highest admission and death rates, while the Department of the Lakes had the highest discharge for disability, total loss, and constantly noneffective ratios.

The Department of the Columbia had the lowest admission rate, while for discharge for disability, deaths, total losses, and noneffective figures, the Department of California had the best record.

### DEPARTMENT OF THE EAST.

All the rates in this department were better than for 1903. Madison Barracks, N. Y., had the lowest noneffective ratio and Fort McKinley, Me., the highest.

### DEPARTMENT OF THE GULF.

All the garrisoned posts of this department, with two exceptions, are situated on or near the sea or gulf coasts. The average health conditions taken as a whole have been good. The average morbidity has not been so great as that prevailing in localities adjacent to the posts. The prevailing diseases in the order of their frequency have been venereal diseases, influenza, dengue, typhoid and malarial fevers, and dysentery. Venereal diseases existed at all posts and have produced a large amount of morbidity. Influenza of a mild type has occurred at two or more posts, but as the weather conditions are more favorable than farther north there have been few serious complications. Typhoid fever in epidemic form has occurred at two posts. Malarial fevers have prevailed to a limited extent at several of the posts, but the filling in of stagnant pools, the use of kerosene oil, and the screening of sleeping barracks is gradually reducing the number of cases at the affected posts. A number of cases of acute dysentery occurred at two posts, believed to have been caused by drinking infected water. The disease disappeared as soon as the cause was removed. The post having the highest noneffective rate was Fort Oglethorpe, while Fort De Soto had the lowest.

### DEPARTMENT OF THE MISSOURI.

Fort Niobrara still retained position of first place, which it has held for some years, as the healthiest post in the department. Jefferson Barracks has the unsavory place at the foot of the list in the relative standing of posts in the matter of health. Its large percentage of noneffectiveness was attributable in part to the prevalence of malarial fevers at this post during the past summer. Furthermore, as it is a recruit rendezvous, its sick report was swelled thereby in a larger proportion than was its garrison. There has been an unusually large number of cases of malarial fever at Jefferson Barracks, the number of admissions for this disease being about twice as large as during any of the last three fiscal years. Efforts have been made to mitigate the mosquito nuisance by spraying with petroleum twice a week all standing water in the vicinity of the post. It is worthy of notation that Fort Niobrara did not report a case of malarial fever for the past calendar year. Typhoid fever has been endemic at Fort Leavenworth since August of 1903, one or more cases having developed every month during that period. While smallpox has occurred at Forts Leavenworth, Riley, and Jefferson Barracks, only 1 case, that at Jefferson Barracks, appeared among the officers and enlisted men. Each post in the department has reported 2 or more cases of measles during the year. This disease became an epidemic of some proportions at Fort Leavenworth in the spring, reaching its culmination during the month of March. In all, 152 cases were admitted to sick report.

### DEPARTMENT OF THE LAKES.

The health of the troops in this department has been in the main satisfactory during the year. There has been no disease as far as known arising from insanitary conditions at posts and the number of cases of preventable diseases has been restricted to a minimum so far as timely recommendations and watchfulness on the part of medical officers could accomplish that object. Nine cases of typhoid fever were reported but it is not believed that the disease was contracted in any case at a post. The prevailing diseases were tonsillitis, bronchitis, diarrhea, rheumatism, gastrointestinal affections, malarial fevers, and venereal diseases. The malarial fevers reported appear to have been contracted mostly, if not wholly, outside of the department, the Philippine Islands being the locality mentioned by some of the post surgeons.

### DEPARTMENT OF DAKOTA.

Fort Yellowstone had the lowest noneffective rate of any post in this department, while Fort Snelling had the highest.

### DEPARTMENT OF TEXAS.

The general health of troops serving in the department during the year was very good. Barring one case of yellow fever reported from Fort Brown, Tex., and two cases of dengue from the same place (all of which occurred in the same month, a rather suspicious circumstance) no disease particularly attributable to locality has occurred during the year. The diseases causing the highest degree of noneffectiveness were those coming under the venereal group. Malarial fevers followed venereal diseases in point of numerical frequency. For the most part the infecting parasite, when mentioned, was almost wholly that of the tertian although the estivo-autumnal form is largely found along the lower Rio Grande and the gulf coast of Texas.

There were 16 admissions for typhoid fever during the year, 10 at Fort Sam Houston, 3 at Fort Brown, and 3 at Fort Logan H. Roots. There were 3 admissions for cerebrospinal meningitis, with 1 death, all at Fort Bliss. An additional 3 cases with 2 deaths have been recently reported by telegraph from the same post.

### DEPARTMENT OF THE COLORADO.

This department contains eight occupied posts and is situated in greater part on the eastern slope of the main range of the Rocky Mountains, with the exception of Forts Douglas and Du Chesne, Utah, which are on the western slope. All of the posts are in the semiarid region of the United States and are at an average altitude of 5,000 feet. Owing to the dryness and altitude of their locations they are without exception exceedingly favorable stations for troops and are in fact included in the region popularly known as the "health resort" for the civilian population of the country suffering with or threatened by pulmonary diseases. The favorable condition of the department is further shown by the fact that malarial diseases practically never originate there, the cases shown on sick report almost always being in soldiers returned from the Philippines or who have become infected in other posts of the United States before arrival. This condition was well shown by the reports made by surgeons from all posts of their investigations of mosquitoes found in their vicinity which show that few of the malaria-bearing species exist, the innocuous varieties mainly being found, excepting at Fort Du Chesne and Fort Huachuca. It is possible that errors have been made in deciding the species in these cases and this matter will be investigated thoroughly during the next warm season and new reports made. Generally speaking the cases of chronic malarial cachexia returning from the Philippines to this department improve rapidly excepting where profound changes in the blood have taken place, which cases are sometimes slow to cure. Dysenteries of the amebic form, however, persist indefinitely. Ordinary chronic diarrhea and severe anemias contracted in that vicinity appear to recover rapidly in this climate. Fort Douglas had the lowest noneffective rate for this department and Whipple Barracks the highest.

### DEPARTMENT OF CALIFORNIA.

This department was, as usual, one of the healthiest in the United States.

### DEPARTMENT OF THE COLUMBIA.

The admission rate for this department was lower than for any other.

### EFFECT OF AGE AND LENGTH OF SERVICE.

The highest admission and discharge for disability rates and the lowest death rate were recorded for soldiers under 30 years of age. The lowest admission figures were for soldiers between 40 and 44 years, the lowest discharge rate between 45 and 49, and the highest death ratio for 50 years and over. The admission rate for soldiers of 19 years and under was very high, nearly seven times that for the age period 40 to 44.

From the point of view of length of service the highest admission and discharge figures occurred in soldiers of less than one year's service, the highest death rate in those of ten years' service and over; conversely the lowest admission and discharge rates were in soldiers of ten years' service and over and the lowest death ratio in those under two years' service.

In assigning a proper value to ratios for age and length of service it is to be borne in mind that the strength used is not a mean strength for the year, but only the strength reported on the last day of the year approximated to the true mean.

The post having the highest noneffective rate was Columbus Barracks, Ohio, while all the other ratios were highest at Fort H. G. Wright, N. Y. Madison Barracks, N. Y., had the lowest noneffective figure and Fort Niagara, N. Y., also on Lake Ontario, had the lowest admission rate and no death.

The cause of the high noneffective rate at Columbus Barracks is probably to be found in the fact that it is a recruiting depot where large numbers of recruits were under observation to determine their physical condition and where contagious diseases were frequently introduced. The high admission rates at Fort H. G. Wright were largely the result of diseases due to exposure, such as rheumatism, catarrhs of the respiratory tract, etc., none of the deaths were due to disease.

## EFFECTS OF SEASON.

Exclusive of venereal diseases, alcoholism, and injuries, the highest rates occurred in March, the lowest admission rate in November, lowest death ratio in September, and lowest noneffective rate in July.

## THE INFLUENCE OF RACE.

None of the colored troops having served outside the limits of the United States proper during the year, a comparison of their rates with those for white troops is given here. The admission, discharge for disability, death, and noneffective figures for colored troops from all causes were 1,176.22, 18.07, 7.79, and 35.62, respectively, compared with 1,315.73, 32, 6.32, and 47.13 for white troops. As usual, therefore, all the rates for colored troops, except the death rate, were lower than for white. All the ratios for colored troops this year were higher than for 1903, except the death rate, which was very much lower.

The admission and discharge rates from disease for white troops were in excess of those for the negroes, while the death ratio was 2.82 per thousand men less than that for the colored soldiers.

The colored troops had only 1 case of sunstroke and 1 of drowning.

The relative prevalence of certain special diseases among white and colored troops, with the admission rates per thousand for each race, are shown in the following tables:

| Disease. | White. | Colored. |
|---|---|---|
| Typhoid fever | 6.00 | 0.64 |
| Measles | 19.04 | 4.17 |
| Malaria | 51.30 | 21.14 |
| Syphilis | 29.60 | 13.78 |
| Alcoholism | 26.43 | 12.18 |
| Dysentery | 8.82 | 4.17 |
| Gonorrhea | 108.61 | 86.83 |
| Insanity | 1.71 | 1.60 |
| Frostbite | 1.30 | 9.61 |
| Smallpox | .29 | .64 |
| Sunstroke | .17 | .32 |
| Pneumonia | 5.12 | 8.65 |
| Tuberculosis | 4.41 | 6.41 |

The relative importance of special diseases as causes of death, with the death rates per thousand for each race, was as follows:

| Disease. | White. | Colored. |
|---|---|---|
| Typhoid fever | 0.29 | .......... |
| Measles | .32 | .......... |
| Cancer | .04 | 0.93 |
| Pneumonia | .76 | 1.56 |
| Alcoholism | .24 | .31 |
| Tuberculosis | .59 | .93 |

There were 27 suicides among the white troops, as against none among the colored soldiers.

## SANITATION.

The following data were compiled from the reports of chief surgeons and monthly and special sanitary reports:

### DEPARTMENT OF THE EAST.

*Fort Andrews, Mass.*—Wooden buildings used as barracks, in good condition, accommodating 50 men. Tents used in good condition, but without flies. Surroundings good. Buildings insufficient in number to accommodate officers and men. The prevailing diseases are bronchitis and coryza. The water supply of this post is bad. The drinking water is pumped from a well near the barracks, which is fed, it is believed, by surface drainage. Before being used it is passed through Forbes sterilizers. The water used for other purposes is pumped from the mortar-battery drainage system. The supply of water, such as it is, has been barely sufficient at times for the needs of the post. The following recommendations were made: That the water carriage system for disposal of sewage be improved, and that drinking water be obtained from neighboring islands or mainland.

*Fort Constitution, N. H.*—The water supply is reported as inadequate, and recommendation is made that water be piped from Portsmouth, N. H. This recommendation is under consideration.

*Fort Du Pont, Del.*—The drainage during wet weather is exceedingly poor. The water supply is insufficient and contains iron and hydrogen sulphide, which give it a disagreeable odor and taste; it is not injurious to health. Work on a new artesian well is in progress.

*Fort Ethan Allen, Vt.*—Water supply is of excellent quality, but not sufficient in quantity for the present command. Five cases of typhoid fever were admitted to hospital at this post during the period September 16 to October 20, 1904, one of them resulting fatally. The surgeon is of the opinion that in all but one of these cases the disease was contracted at or near Manassas Junction during the maneuvers in Prince William County, Va. The excepted case was a private of the hospital corps, who probably became infected in the hospital through failure on his part to carry out the rules laid down for personal disinfection.

*Fort Greble, R. I.*—Buildings on reservation are satisfactory except guardhouse, which is inadequate in size. The water supply of this post is unsatisfactory, and recommendation is made that water be piped from Saunderstown. The commanding officer states that while the supply of water from the springs at Saunderstown is excellent in quality, the quantity is uncertain and that a distilling plant would better serve the needs of the post.

*Fort Hamilton, N. Y.*—Many of the buildings are reported as old, going to decay, and very unsightly. Plans for remodeling the post have been submitted.

*Fort Hancock, N. J.*—Seven cases of typhoid fever occurred at this post during the period August 26 to November 1, 1904, the dates of admission of the first and last cases, respectively. The cases followed the appearance at the post of an ambulant case in the person of a civilian laborer employed by a contractor engaged in erecting new buildings at the post. One of the cases was that of the wife of an enlisted man, living in a wooden shanty near the quarters of the civilian laborers. The other cases were among soldiers living not far distant. The post drinking water was considered above suspicion, and the infection is thought to have been transmitted by flies. Energetic measures were taken to prevent the access of flies to food supplies. The last case admitted was that of a recruit fourteen days at Fort Hancock, and the probability of his having contracted the disease at the post was considered doubtful. The patients all recovered. The surgeon reports that the water is a surface supply, and hence not satisfactory or safe. December 1 the commanding officer stated that the work of sinking an 8-inch artesian well would be commenced in about a month. There are ten detached houses on the reservation not connected with sewers. These are shacks which are scattered over territory which it is impracticable to connect with a sewer system. Earth closets are used by the occupants and emptied each week. It is believed to be a mistake to allow such buildings to be constructed on a military reservation, as they are a source of petty annoyance and are a menace to the health of a command.

*Fort Howard, Md.*—Drainage of low grounds on the reservation is not good. Estimates for filling in these marshy grounds were disapproved by the Quartermaster-General's Office. Six cases of typhoid fever occurred at this post during the period September 4 to October 3, 1904, with one death. The disease in these cases was believed by the surgeon to have been contracted in the city or neighborhood of

Baltimore, where typhoid fever was prevalent during the summer and fall, and not due to any conditions existing at the post.

*Fort Jay, N. Y.*—Two cases of typhoid fever occurred at this post among the enlisted men, the first of which was admitted October 16, 1904, and resulted fatally; the other was admitted November 3, 1904, and returned to duty. The source of infection in the first case is unknown. As the soldier last taken sick had not been off the island for a month prior to his illness, the disease in his case was considered to have been contracted on the island. The water supply was suspected, and orders were given regarding the use of boiled water for drinking purposes.

*Fort McHenry, Md.*—The barracks are described as old, without ventilating or general heating systems.

*Fort Monroe, Va.*—Water supply is ample and of fair quality. All drinking water is supplied from post distilling plant.

*Fort Mott, N. J.*—Present buildings are temporary and inadequate. New barracks, hospital, and officers' quarters are now in course of construction. Water supply is described as fair in quality.

*Fort Myer, Va.*—The work of draining and oiling done during the past two summers has had a marked effect on malarial diseases at this post. This work is only temporary and is ineffective in removing the conditions which produce the disease. Draining and oiling have to be kept up constantly from March to November. The surgeon urges that efforts be made to obtain funds for permanent drainage, clearing away of underbrush, etc. The water supplied the post, though reported as good in quality, is filtered, and examinations of same are made continuously at the hospital laboratory. Eight cases of typhoid fever occurred at this post, principally among members of the signal corps, during the period September 13 to November 14, 1904, with one death. The infection did not seem to have occurred in any one place, and the surgeon states that it did not originate at the post.

*Fort Niagara, N. Y.*—Four cases of typhoid fever occurred among the enlisted men at this post in October, 1904, three of which were admitted on October 4 and the other October 8. The cases are believed to have originated in Buffalo, N. Y., in which city the disease was epidemic at the time. They all recovered. The general water supply of this post is reported as contaminated, and water for drinking and culinary purposes is sterilized by means of Forbes sterilizers.

*Fort Porter, N. Y.*—An extremely unsatisfactory sanitary condition of the guardhouse is reported. Plans were called for looking to the rectification of the sanitary defects, but the matter appears to have been dropped without any relief. No substantial improvements have been effected, although defects have been noted by several post surgeons and approved by as many commanding officers. The overcrowding has been marked. The ventilation is entirely inadequate, the building is damp, and new flooring is a necessity. The bathing facilities are inadequate, and there is no hot-water supply. It is an extremely difficult matter to keep prisoners even reasonably clean under these conditions, and baths without hot water the greater part of the year in this climate are impracticable. The walls are badly stained, cracked, and broken, and in places the lathwork exposed. It has been difficult to keep the prisoners free from vermin. Extensive repairs are a real necessity. The building as it now stands is of very little value, and to put it in good shape will involve a considerable outlay. A new and modern structure is recommended. The conditions in two of the company lavatories are unsatisfactory. The closets are old, out of repair, and because of the old patterns worn-out parts can not be replaced. The bath tubs are old and badly rusted, and the general condition of the bathrooms is unsatisfactory. Extensive repairs are recommended in these quarters, including new tubs, closets, and washing fixtures complete. Owing to the unsatisfactory conditions existing the odor from the closets is marked and very objectionable. Plans and specifications for a new guardhouse have been submitted.

*Fort Preble, Me.*—The insanitary condition of private property adjoining the reservation as described in last annual report remains the same.

*Fort Revere, Mass.*—The portion of the water supply furnished by the deep wells shows no improvement and the quality of the water is bad. The entire matter has been several times reported upon and steps taken to discard the well and obtain the entire supply from the mains of the Hingham Company.

*Fort Schuyler, N. Y.*—The officers' quarters and Eightieth Company Barracks are reported as being impossible to keep warm in cold weather.

*Fort Slocum, N. Y.*—The surgeon reports as necessary the construction of new barracks in addition to those now authorized and the installation of new systems of heating, lighting, and plumbing in the old barracks. Recruits continue to occupy "wooden hovels."

*Fort Trumbull, Conn.*—The water supply is good in quality, except after a heavy rain, when it is very muddy and of a bad odor. It is sometimes deficient in quantity. Buildings are in fair condition only. The closets of company quarters, the plumbing of hospital, etc., are in a worn and insanitary condition.

*Fort Wadsworth, N. Y.*—Casemate barracks are leaky, poorly ventilated, poorly lighted, and generally insanitary, owing to structural defects.

*Fort Warren, Mass.*—A 3-inch extra heavy lead pipe, to be laid in a dredged channel 5 feet deep, to be used as an auxiliary water main in addition to the 6-inch cast-iron main, which has been broken and worn-out three times during the past three years, is recommended.

*Washington Barracks, D. C.*—Boiled water is used for drinking purposes.

*Fort H. G. Wright, N. Y.*—The general condition of the water supply is poor. Very limited quantities of potable water are furnished for drinking and cooking only. A water still of 1,000 gallons capacity daily is in operation at this post. The distilled water is of excellent quality, but the supply from wells is somewhat hard and salty.

## DEPARTMENT OF TEXAS.

*Fort Bliss, Tex.*—Fort Bliss is favorably situated on an elevated mesa about 5 miles from the town of El Paso, Tex. The general sanitary condition of the post is reported as very good. The earth closet is in temporary use at present. The sewer system of the post is undergoing extensive repairs, including the installation of a septic tank; this latter is a much-needed improvement, as the disposal of sewage heretofore has not been satisfactory, unsuccessful attempts having been made to dispose of it on the open ground.

*Fort Brown, Tex.*—This post is situated on the lower Rio Grande, directly adjoining the town of Brownsville, and has the largest rate of admissions and the largest constant noneffective list of any post in the department. The post is badly located in two respects, viz: Low-lying ground in an alluvial river bottom partially surrounded by a more or less stagnant lagoon, and the close proximity of a town which is a constant menace from a sanitary point of view. The buildings are old and difficult to keep in proper repair, but all living habitations are well screened.

A new system of sewers has been installed in the post since February, 1904, but no work as to connecting it with the various post buildings has been undertaken save in the instance of the three-company barracks, which were connected by order of the post commander upon recommendation of the surgeon.

*Fort Clark, Tex.*—Fort Clark is one of the oldest posts in the department, and the buildings are reported as old and in need of repair. In fact the condition of the buildings is such that both the surgeon and post commander have reported them as not worth the cost of repair, and the latter has recommended that the present post site be abandoned and another site in the vicinity of Eagle Pass, Tex., be selected for a new post. The hospital building is in an especially bad condition. The sum of $30,000 has been appropriated by Congress for the erection of a new hospital, but on recommendation of the post and department authorities, and pending decision of the question of abandoning or rebuilding the post, no step has been taken toward its construction.

*Jackson Barracks, La.*—This post is now being practically rebuilt and a new system of sewerage is being installed, and when completed the post should be thoroughly modern in all sanitary requirements.

*Fort Logan H. Roots, Ark.*—The general sanitary condition of this post has been satisfactory except as to water supply. The post is supplied from the town water system of Little Rock, Ark., and is taken from the Arkansas River, and when not carrying large quantities of silt, during high water, has been reported as satisfactory. The water main supplying the post which crosses the river is liable to be washed out at each recurring overflow of the river; this occurred in June last, and the post was cut off from this source of supply for three months, compelling resort to post wells and driven wells on an adjoining sand bar in the river, the supply from the latter source being reported as bad. Connection with city mains was again made in September, and action has been taken looking to an independent water supply for this post in case the city company fails to give an ample and satisfactory supply.

The prevailing diseases are malarial and venereal, and these two account for the large number of admissions at this post.

*Fort McIntosh, Tex.*—The general sanitary condition of this post during the year has been as satisfactory as existing conditions permit. The buildings are suitable and well kept and the grounds well policed. This post was visited by yellow fever in 1903 and it was feared that the visitation would be repeated in 1904; but fortunately this was not the case, and was no doubt due in a large part to the careful and comprehensive measures of prevention instituted and systematically carried out, although the immediate proximity of the towns of Laredo and Nuevo Laredo, under existing conditions, will always be a menace to this garrison. The post is practically free from mosquitoes of all kinds, while the *Culex* and *Stegomyia* are reported in Laredo and all forms as being very abundant in Nuevo Laredo.

*Fort Reno, Okla.*—The buildings have been reported, with one exception, as being in good condition. The exception noted was that one of the company barracks was badly overcrowded. An expenditure of $3,000 was made for the enlargement of this barrack and the condition thereby corrected.

Mosquitoes of the varieties *Anopheles* and *Culex* are numerous, and this is evidenced by the rather large number of admissions for malaria, viz, 83 out of a total of 560 from all causes. The source of these mosquitoes is said to be the old buffalo wallows adjoining the post, which, on account of the lay of the ground, it has been found impossible to thoroughly drain. After a number of recommendations petroleum was procured and these points treated with good results.

*Fort Ringgold, Tex.*—The sanitary condition of this post for the year has been, with a few minor exceptions, very satisfactory. The health of the command has been by far the best of any post in the department. The water supply is pumped from the Rio Grande and after being thoroughly sedimented is distributed through the mains. It is characterized as suspicious by the surgeon and distilled water is used for drinking and culinary purposes; the supply is adequate for the present garrison. An artesian well is being drilled, but the chances of obtaining water do not seem encouraging.

*Fort Sam Houston, Tex.*—Several additional barracks and quarters are now in process of construction at this post and Congress has been asked for an appropriation for the erection of a new hospital. The water supply is excellent in quality and abundant as to quantity. A new steel tank of 300,000 gallons capacity is about completed.

*Fort Sill, Okla.*—The general sanitary condition of this post has been very good, and, with the exception of malaria, no disease particularly attributable to locality has prevailed.

*Fort St. Philip, La.*—This post is situated on the left bank of the Mississippi River, 73 miles below New Orleans; it is a subpost of Jackson Barracks and is garrisoned by a detachment of 61 men from that post. The health of this post for the year, notwithstanding its apparently unfavorable location, has been very good.

## DEPARTMENT OF THE LAKES.

The sanitation of posts has been carefully supervised by medical officers and the infrequency of recommendations is indicative of satisfactory conditions throughout the department. At Fort Sheridan and Fort Thomas sanitary defects in the guardhouse were noted and corrected. At Fort Thomas and Columbus Barracks the water supply from the waterworks of the cities near which they are situated is regarded as unsafe, but the recommendations by the surgeons of the respective posts that the water be boiled appear to have been carried out and danger from that source avoided. At all other stations in the department the drinking water is reported as wholesome.

At Fort Brady, Mich., new company barracks were completed and the troops moved into them. Systematic drills were given in the new gymnasium during inclement weather throughout the year. Both of these changes from the old order may be regarded as important sanitary improvements.

Nearly all sanitary recommendations made during the year by post surgeons were of a minor character and were favorably acted upon. The hospital buildings at the various posts in the department have been kept in good repair. At Fort Sheridan the building is not sufficiently commodious for the command but is in a good state of repair, and additions to it are to be made soon.

## DEPARTMENT OF CALIFORNIA.

The question of the proper protection and filtration of the water at Benicia Barracks is still under consideration, efforts being made by the chief surgeon to obtain a Jewell or other mechanical filter for this post in place of the Pasteur filter recommended by the Quartermaster's Department, the latter not being adapted for the purpose of clearing the water of animal and vegetable substances. A board of officers has been convened by the War Department to consider a general reconstruction of this post, and it is believed that all these insanitary conditions will be corrected in this way.

Reports of overcrowding and insufficient water supply were received from the depot of recruits and casuals, San Francisco, Cal., and recommendation made that an additional tank capable of holding 20,000 gallons be supplied as soon as practicable for the hospital and officers' quarters. Estimates were made for a proper water supply for domestic use and fire purposes, and ventilators were put in the barracks occupied by troops.

Overcrowding was also reported from Fort Baker and corrected by moving many of the men into the vacant dining room formerly used for prisoners, this building being moved nearer the thirty-second company's quarters to enable the occupants to avail themselves of the urinals, closets, etc.

Several reports were made of overcrowding at Fort McDowell, and after much correspondence and careful consideration report was made May 31, 1904, that each organization is now quartered in barracks without overcrowding.

When it was ascertained that the department rifle range at Point Bonita was to be occupied by a large detachment of prisoners with their guards, it became necessary that more permanent arrangements for the disposal of excreta and wastes be provided, and recommendation was made by the chief surgeon that the sanitary carts and odorless excavators formerly in use at the model camps at the Presidio of San Francisco be sent to that post. This recommendation was approved and the necessary apparatus installed.

## DEPARTMENT OF DAKOTA.

*Fort Assinniboine, Mont.*—During the spring and summer months extensive improvements have been carried out and a complete separate sewerage system is being installed all over the post carrying only excreta and liquid wastes. This will replace the old dry earth system of disposing of excreta and the slop-can system of disposing of liquid waste.

*Fort Harrison, Mont.*—The only important change in the sanitary condition at this post during the year has been the completion of the sewer system. The prevailing diseases were bronchitis and tonsillitis. No disease is believed to have been due to insanitary conditions.

*Fort Keogh, Mont.*—Important changes in sanitary conditions during the year have been made by the establishment of a modern sewerage system. During the first six months of the year the prevailing diseases at this post were tonsillitis and influenza, both due to climatic conditions and the poor condition of barracks; these in winter are overcrowded, lighted with coal-oil lamps and heated by stoves burning soft coal, and of a poor quality at that. The buildings at the post are old, out of repair, and poorly ventilated.

*Fort Lincoln, N. Dak.*—January 4, 1904, a new hospital was completed at this post and occupied by the medical department on the same date. The accommodations for the sick in hospital have been limited at times owing to lack of room, especially during the early part of the year when the prevailing diseases were of the respiratory tract and due to overcrowding of the barracks. During the year, however, another barrack, guardhouse, administration building, and quarters for the sergeant (first class) of the hospital corps have been completed, which has materially relieved the overcrowded condition of the barracks.

Among the most important sanitary changes during the year at this post was the completion of a water-softening plant. The working of this plant is entirely satisfactory and permits of the use of the water of the artesian wells on the reservation, as formerly water for drinking and culinary purposes was obtained from the Missouri River.

*Fort Missoula, Mont.*—Important changes in the sanitary conditions at this post were the installation of plumbing in the houses and barracks and the completion of a sewerage system for the removal of excreta and kitchen wastes.

*Fort Snelling, Minn.*—The general sanitary condition of the post has been good and no important changes have been made or recommended.

*Fort Yellowstone, Wyo.*—The sanitary condition of this post in general has been excellent and no important changes have occurred during the year. There are no closets for servants in any of the quarters at this post; the use of the closets in rear of the quarters is therefore absolutely necessary for the present.

## DEPARTMENT OF THE COLORADO.

*Fort Apache, Ariz.*—Much complaint of the quality of the water supply at this post has been made during the entire year and a prevalence of diarrhea has been quite constant. A surface system of drainage had been in use previous to 1904, by which sewage was carried a short distance from the buildings and discharged on the surface of the ground, a very unsatisfactory and dangerous method. During the year 1904 a very complete modern system of underground sewers has been completed and is in satisfactory operation; the discharge is in a canyon some distance from the post and the location is considered satisfactory and safe. It is understood that a complete plan for a new water supply for the post has been elaborated and is now in the hands of the authorities in Washington. This water is to be brought from a spring about 3 miles from the post by gravity to a proposed new reservoir. The location of the spring is such that it can be entirely protected from contamination by Indian camps or otherwise, and the quantity is said to be amply sufficient for all present and prospective wants without using water from the present suspicious source of supply. Six Forbes sterilizers have been supplied for the use of the post during the year.

Attention is invited to the new sewer system as being a highly important sanitary improvement during the year. All water consumed at the post is ordered to be boiled, but the supply from the present source is so small and dangerous in character that the new source of supply alluded to should be thoroughly investigated and developed if this post is to be kept up. It is understood that at present the plan has been disapproved, owing to the prospective decrease in the size of the garrison.

*Fort Douglas, Utah.*—The improvements during the year have consisted in the building of new quarters and other buildings of stone to replace the old ones of wood, in pursuance of a definite plan adopted by the military authorities to gradually rebuild the post, making it one of the finest in the United States and of a capacity to accommodate a full regiment of infantry. The old crowded and insanitary wooden buildings will be done away with entirely as soon as the new stone buildings are completed to take their places, and eventually this post will be one of the most satisfactory and desirable in the United States.

*Fort Du Chesne, Utah.*—Tonsillitis was reported as arising from foul air and lack of ventilation in barracks, which condition was amended by the authorities. The post has recently been supplied with a new system of underground sewers constructed of 6 and 8 inch vitrified sewer pipe, with proper manholes and self-flushing attachments at frequent intervals. Ten buildings are attached and others will be in the future.

*Fort Grant, Ariz.*—This post has been practically abandoned for the past two years, it now being considered a substation of Fort Huachuca, and is garrisoned by one troop of cavalry from that post, which is supposed to be changed frequently. The cause of the abandonment of this post is the gradual exhaustion of the water supply, which has been going on for the past ten years. If no attempt is made to obtain underground water for this post, it is believed that it should be totally abandoned and the small garrison of one troop of cavalry removed.

*Fort Huachuca, Ariz.*—This post has been for many years considered one of the most salubrious in the department, but during the last year has shown a remarkable number of cases on sick report diagnosed as "diarrhea acute." These cases are found in the cold as well as the hot months. It is difficult to understand what is the cause of this disease. The water supply is derived from flowing driven wells and springs on the reservation, which are so located as to be free of contamination from human habitation or other sources, and which has been habitually considered and reported as good in quality. The continuance of the disease during cold weather after the fruit season would seem to eliminate this cause and leaves the actual origin a matter of uncertainty.

*Fort Logan, Colo.*—This post, the largest in the department, is garrisoned by a full regiment of infantry and rather overcrowded. Two new modern barracks should be built to properly house the present garrison and give them the sanitary accommodation required by the number of organizations. The buildings now existing are good and appropriate, with the exception of the sinks and urinals of eight companies. These are situated in brick outbuildings, are of the old trough pattern, and are entirely obsolete, insanitary, offensive, and should be replaced by new pattern water-closets and self-flushing urinals. Estimates for these improvements have been recently forwarded, and it is hoped that the amount needed will be promptly appropriated. The hospital is entirely inadequate to the size of the garrison, and requires at times the use of tents to enlarge its accommodations for the sick.

The principal sanitary improvements recently are the new artesian well and the recent enlargement of the band quarters and the guardhouse. This latter was greatly needed, the accommodation for prisoners existing previously being inadequate and causing an overcrowding injurious as to health and morals of the inmates. The post has also very recently been wired and illuminated with electricity, an improvement long recommended by the Medical Department, and one believed to be of great sanitary importance from the elimination of smoke, soot, and odor, and also by improving the quality of air in barracks and quarters at night, from the fact that the numerous lamps are not consuming the oxygen of the air, frequently deficient in crowded barracks. In addition the great increase of cheerfulness in the brilliantly lighted barracks, gymnasium, exchange, etc., has a tendency to keep the soldier at home instead of being driven to the nearest saloon for a bright cheerful place for relaxation.

*Whipple Barracks, Ariz.*—This post was abandoned about eight years ago and reoccupied April 29, 1902. It is at the present time being rebuilt on a basis of a garrison of four companies of infantry. The new buildings are being constructed of brick and stone in the most substantial manner, with all modern improvements in the way of plumbing, baths, etc. Taken in connection with the remarkably fine climate of this location this post when completed will be one of the most desirable as a place of residence in this department. A new hospital has been authorized and it is believed that work on it will be started soon. The present buildings occupied as men's quarters and hospital are old, dilapidated, and unsuitable, but will be done away with as rapidly as new ones are completed to take their places. All water used for drinking and culinary purposes is boiled.

*Fort Wingate, N. Mex.*—This small but desirable post has had during the past year rather a smaller proportion of sickness than usual, the active diarrhea and catarrhal troubles being not very numerous. In April the insanitary location and condition of the lavatories, water-closets, and urinals in some of the barracks were noted. Later in the year an appropriation was obtained for new toilet rooms with modern plumbing and fixtures of the best quality, and contracts have been made for their establishment.

## DEPARTMENT OF THE MISSOURI.

The item of improper sanitation most frequently commented upon during the year has been the inadequacy of guardhouse accommodations, both as to air space and bathing facilities. The posts at which these insanitary conditions have been most emphasized are Jefferson Barracks, Forts Crook and Leavenworth. The lack of lavatory facilities in the Jefferson Barracks guardhouse has been remedied during the year by the installation of shower baths, additional closets, and urinals.

The barracks at Fort Niobrara are in exceedingly bad repair and insufficiently ventilated. Officers' quarters leak badly during rains. Hospital is in deplorable state of repair; entire estimate for repairs for the year disapproved. A number of low places in vicinity of barracks require filling in, as after rains water stands and breeds many mosquitoes. The quarters occupied by married noncommissioned officers and soldiers are in an exceedingly dilapidated condition and are supplied with ordinary sinks.

The prison buildings at Fort Leavenworth are very inferior. Aside from being obsolete in plan they are wholly inadequate to accommodate properly the large number of prisoners incarcerated therein.

The crematory, which has been under trial for some time, has proved satisfactory and is now disposing of all garbage and other dangerous waste.

The guardhouses at Forts Des Moines, D. A. Russell, and Riley are overcrowded. At Jefferson Barracks the barrack accommodation for recruits is insufficient, while the barracks at Fort Washakie have been more or less overcrowded throughout the year. All buildings at Fort Washakie are very much in need of repair. Bathing facilities in all barracks and three of the officers' quarters are inadequate. Quarters occupied by Company L, Eleventh Infantry, absolutely without arrangements for a full bath. Hospital has one bath tub for use of hospital-corps detachment and patients.

The water-closets and bathrooms in the older barracks at Fort Riley are in very bad condition.

The pit latrines in use at Fort Washakie are not satisfactory, and recommendation has been made that they be replaced by dry earth closets; examination of the sanitary reports from this post show that a like recommendation has been made almost monthly for the last ten years.

### DEPARTMENT OF THE GULF.

The sanitary conditions of the posts in the department at this time, with two or three exceptions, are very good. The sanitary problems at the three seacoast posts excepted involve the supply of a good, wholesome water for drinking purposes, a good, safe disposal of sewage and refuse, and eradication of disease-bearing mosquitoes as far as possible, and protection against them by screens where their complete destruction is impracticable. These problems are being solved and the sanitary conditions are steadily growing better.

*Fort McPherson, Ga.*—The hospital proper is in very good repair. The bed capacity is 51 beds. As this post has now the capacity for a full regiment of infantry the erection at an early date of a new modern hospital of at least 60 beds capacity is recommended. There is a very desirable site for such a building near the old and new barracks.

*Fort Oglethorpe, Ga.*—This post is in excellent sanitary condition.

*Fort Morgan, Ala.*—The sanitary condition of this post is very good.

*Fort Barrancas, Fla.*—The sanitary condition appears to be satisfactory. The disposal of garbage and other wastes by burial appears to be temporary; they should be disposed of by crematory or dumping into the sea, if practicable. The eradication of mosquitoes should be made permanent, if practicable. An addition to the hospital should be made to provide adequate quarters for the hospital corps detachment, as it is at present insufficient for the purpose.

*Fort De Soto, Fla.*—The sanitary conditions appear to be good.

*Fort Dade, Fla.*—The general sanitary condition had been good previous to the outbreak of an epidemic of typhoid and dengue fevers the latter part of December. It seems probable that the disease was originally brought from Tampa, Fla. The insanitary condition of a part of the island on which Fort Dade is situated and occupied by workingmen of the engineer department has been reported and will be corrected. The sewer system is in good condition and the water supply for drinking purposes is rain water held in cisterns above ground.

*Fort Screven, Ga.*—Imperfect drainage exists at this post, which is due to the low character of the land on which the post is situated. This will be improved by raising the grade, which is in contemplation. Plans and specifications for a new hospital have been approved.

*Key West Barracks, Fla.*—The health conditions have been good aside from an outbreak of dengue fever.

*Fort Fremont, S. C.*—The sanitary condition is reported as good. Where needed, the post has been ditched and drained. New barrack buildings have been recommended, although the present buildings have been repaired and made more inhabitable. A new hospital has been erected during the year.

*Fort Moultrie, S. C.*—The sanitary condition of the post has not been satisfactory on account of the lack of an adequate supply of water for the sewer system. An artesian well is being bored and it is hoped will provide artesian water for the post. The general health in spite of these defects has been very good.

*Fort Caswell, N. C.*—The sanitary conditions appear to be fair. Drainage is bad. The many water holes, old wells, and abandoned water tanks, etc., are covered with petroleum once a week. Cistern water is used for potable purposes. General supply is abundant, but brackish and unfit for drinking. Mosquitoes are gradually disappearing from the post.

## DEPARTMENT OF THE COLUMBIA.

*Boise Barracks, Idaho.*—Buildings old but good, new construction contemplated. Dry earth closet system introduced in barracks and hospital. Sewerage in officers' quarters. Pits for remainder of post. Will be remedied by installation of sewer system with reconstruction of post.

*Fort Casey, Wash.*—Buildings are new and commodious except hospital, its size being inadequate. Flushing water is at times inadequate, but will be remedied by completion of permanent supply. Drinking water good and sufficient in quantity, but contains an excess of chlorides.

*Fort Flagler, Wash.*—Water supply is very unsatisfactory in quantity and quality. During winter months rain water collected from roofs is used for drinking; for other purposes filtered sea water is used. In summer, drinking water is brought from an artesian well about 12 miles distant by boat. Sea water rapidly corrodes plumbing and is unfit for bathing.

*Fort Lawton, Wash.*—The guardhouse is inadequate for the number of prisoners confined therein.

*Vancouver Barracks, Wash.*—Buildings in good condition and well ventilated. New hospital, artillery, and infantry barracks completed. Grounds well policed. Recommendation has been made for a post laundry.

*Fort Walla Walla, Wash.*—With but two or three exceptions buildings are in poor condition. Recommendation has been made that a bath house be erected and modern water-closets installed.

*Fort Worden, Wash.*—The quantity of the water supply is sufficient but the quality is poor. A new company is expected to supply the post with water from the Olympic Mountains by May, 1905.

*Fort Wright, Wash.*—Water supply is good except in summer, when it is contaminated by dross from silver mines. With a battalion garrison the supply was inadequate during summer. The hospital and a number of the barracks are not well drained.

## ALASKA.

The average mean enlisted strength of the troops serving in Alaska during the year was 730, composed of infantry, signal corps, and hospital corps, all white.

It appears that Alaska was a remarkably healthy station for troops. The admission, death, discharge, and noneffective rates were 838.36, 6.85, 13.70, and 28.24, respectively, as compared with 1,305.83, 6.44, 31.04, and 46.32 for the United States proper. Nearly one-half of the admission and noneffective ratios was the result of injuries, venereal diseases, and alcoholism. The healthiest post was Fort Gibbon, while the least healthful was Fort Egbert. The healthiest month was June, with an admission rate of 25.36, and the least healthful, January, with an admission rate of 62.61.

The fact that there was no case of typhoid fever, pneumonia, or eruptive fevers is notable. Malarial fever and dysentery were rare, while tuberculosis, venereal diseases, and alcoholism had high rates. It is of interest that the 4 admissions for malaria, representing 2 cases, occurred at Fort Egbert, one of the two posts from which anopheles mosquitoes have been reported as present.

Of the 5 cases of tuberculosis, 1 was developed within three months of enlistment and was probably existent at the time of enlistment; the others had been in service from two to ten years.

The death and discharge rates were the highest for soldiers whose age is included in the five-year period from 20 to 24 years; the highest admission and noneffective rates occurred among men 45 to 49 years of age. The admission, constantly noneffective, and discharge rates were much higher for soldiers in the first year of service; the death rate was based on too small a number of deaths to be of any value. As regards length of service in Alaska the highest admission rate was shown in the first year, but here again the figures were too small to be of value.

## SANITATION.

The following data as to the sanitary conditions at the six garrisoned posts were obtained from special reports:

While the barracks at Fort Egbert are inadequate, all new buildings have been completed and are reported to be in excellent condition. The buildings are comfortable and the grounds in good condition at the other posts in Alaska.

The water supply at all the posts is satisfactory in quantity and quality, except at Fort Egbert on the headwaters of the Yukon, where the water is from a well 30 feet deep, delivered in carts, and is reported hard, contaminated by mineral and vegetable matter, and liable to sewage pollution. At Fort William H. Seward the water is piped from the water system of Skagway and is originally taken from a pure mountain lake. The water supply of Fort St. Michael is also piped into post from a mountain lake for use in summer; in winter the water is obtained by melting ice from this same lake. At Fort Gibbon the water is from a well and delivered by water cart; it is boiled only in spring and summer, when it contains considerable organic matter. At Fort Liscum the water is from a glacial stream and delivered by wagon. At Fort Davis, Nome River supplies the water, which is delivered by cart in summer after distillation, but in winter without preliminary purification.

The sandy ground on which Fort Egbert is located absorbs the rain as quickly as it falls, while the post at Fort Gibbon is well drained by means of ditches. The land on which Fort Liscum is built has a gradual slope from the base of the mountain down to the shore of the bay, thus providing ideal conditions for surface drainage. The drainage at Fort St. Michael is unsatisfactory. The rainfall during summer is very large and the ground is difficult of drainage. A system of drains has been dug for the post, but appears to be insufficient in number and not to have sufficient fall to keep the soil drained. As a result of combined dampness of soil and atmosphere, rheumatism and sore throat are very prevalent during the summer season. At Forts William H. Seward and Davis surface drainage is satisfactory, several ditches having been dug extending through the larger part of the latter post.

Excreta are disposed of partly by the cesspool system and partly by dry-earth closets at Fort Egbert, the ultimate disposal being Mission Creek. Liquid wastes are disposed of in like manner. A modification of the dry-earth system is in use at Fort Gibbon. Zinc-lined wooden boxes containing sawdust are used to receive the excreta, which are dumped daily into the river. Separate tin pails are provided for urine. All other wastes are similarly disposed of. At Fort Liscum a system of dry-earth closets is depended upon for the disposal of excreta. The closets are emptied at frequent intervals, the fecal matter being deposited in the bay. A complete sewerage system is very much needed at this post. Other wastes are collected daily and emptied into the bay. The box-privy system is used at Fort St. Michael, lime being used as a disinfectant in and about the boxes. Other wastes and excreta are collected in cans, towed several miles out in the bay, and disposed of. Excreta are deposited in tin-lined boxes at Fort William H. Seward, which are daily emptied into the Skagway River below the town site. Other wastes are collected by police cart and emptied into stream. The excreta at Fort Davis having been received in water-tight receptacles placed in the different latrines are deposited in pits on the beach 2 miles below post, while other wastes are similarly disposed of.

Fort William H. Seward is the only post in Alaska which is reported as being generally free from mosquitoes. At Fort Liscum they appear about the middle of June and remain until the middle of September. The variety is not known, but in appearance they differ from the ordinary mosquito found in temperate climates although of practically the same size. While extremely annoying at times and giving rise to local irritation in many individuals, there is no evidence to connect these insects with the causation and transmission of disease. Anopheles and culex varieties are present at Fort Gibbon during June and July each year, but appear to have no connection with existing diseases. Mosquitoes breed practically everywhere in the vicinity of Fort Egbert, are of the culex and anopheles varieties, and are generally present during the months of June and July. During July and August the harmless culex variety of mosquito is found at Fort Davis, while at Fort St. Michael mosquitoes are very prevalent for several weeks during the summer. The culex species is the only form observed. At no post in Alaska have measures been adopted toward the destruction of the mosquitoes or destroying their breeding places.

## CUBA.

The last United States troops were withdrawn from Cuba February 5, 1904. The period of time and the number of troops (four companies) being so small the statistical data are of no importance.

## PORTO RICO.

The two companies of coast artillery remaining in Porto Rico at the beginning of the year were withdrawn early in May, since which time that island has been garrisoned by native troops only; the following figures and remarks apply exclusively to the latter.

The mean strength of the Porto Rican regiment was 540 men, distributed to the two stations, San Juan and Henry Barracks, Cayey.

The admission, death, discharge for disability, and noneffective rates were 1,420.37, 3.70, 12.96, and 61.84, respectively, compared with 1,137.09, 22.34, 5.86, and 32.05, the rates for Filipino native troops, and with 1,484.73, 0.00, and 25.95 (noneffective rate not available), their own ratios for 1903. Both admission and discharge figures show an improvement over those for the preceding year.

There were two deaths, one the result of syphilis and the other of acute dysentery.

The principal cause of admission was venereal disease, for which the Porto Ricans gave a rate of 379.62, more than twice as great as for any other race.

The most healthful month was July, while May was the least so; the unfavorable factors in May appear to have been dyspepsia and malaria.

## RECRUITING.

The following statement shows the number of Porto Ricans who applied for enlistment during the year 1904, the number accepted, rejected on primary examination, and declined, with ratios per thousand:

| | Number. | Ratio per 1,000 of Porto Ricans examined. |
|---|---|---|
| Examined | 552 | 1,000.00 |
| Accepted | 519 | 940.22 |
| Rejected on primary examination | 29 | 52.53 |
| Declined | 4 | 7.25 |

The proportion of recruits accepted was 940.22 per thousand, a proportion much larger than that for either white or colored American recruits. This is accounted for by the fact that the regimental commander was given authority to waive certain physical defects in his discretion.

The next table shows the ages of accepted Porto Rican recruits and the proportion at each age per thousand:

| Age. | Number. | Ratio. | Age. | Number. | Ratio. |
|---|---|---|---|---|---|
| 18 years and under | | | 31 years | 13 | 25.0 |
| 19 years | | | 32 years | 3 | 5.8 |
| 20 years | 1 | 1.9 | 33 years | 1 | 1.9 |
| 21 years | 47 | 90.6 | 34 years | | |
| 22 years | 61 | 117.5 | 35 years | 3 | 5.8 |
| 23 years | 41 | 79.0 | 36 years | 1 | 1.9 |
| 24 years | 83 | 159.9 | 37 years | | |
| 25 years | 73 | 140.6 | 38 years | 1 | 1.9 |
| 26 years | 69 | 132.9 | 39 years | | |
| 27 years | 51 | 98.3 | 40 years and over | | |
| 28 years | 27 | 52.0 | | | |
| 29 years | 24 | 46.2 | Total | 519 | 1,000.0 |
| 30 years | 20 | 38.5 | | | |

The proportion, 24 years of age and under who enlisted, was 44.9 per cent, compared with 54.2 per cent and 40.9 per cent for white and colored recruits, respectively. No Porto Rican under 20 years of age was enlisted, while 24 years appears to be the age at which the largest number were accepted.

The height of the highest proportion of accepted Porto Rican recruits, 22.4 per cent, was 5 feet 7 inches, the same as that for both the white and colored applicants enlisted, while the proportion of those approved under 5 feet 4 inches was only a little more than half that of white and colored recruits, being but 0.39 per cent; the proportion of white and colored recruits over 5 feet 7 inches was, however, much larger than for Porto Ricans. Five Porto Ricans 6 feet and over were taken into the service.

A material difference was noted in the weights of accepted Porto Ricans and American-born recruits. The weights of 39.1 per cent, the highest proportion of approved Porto Ricans at all ages, being between 120 and 129 pounds.

These weights were from 10 to 20 pounds less than the corresponding figures for American troops, both white and colored.

Nearly half of the 519 Porto Ricans accepted for service during the year showed a chest measurement of 32 inches. Below 32 inches the figures were 17.9 per cent compared with 8.8 per cent for American troops, white, and 6.8 per cent for American troops, colored. Porto Rican troops having a chest measurement above 34 inches constitute only 5.6 per cent of the whole, compared with 24.9 per cent and 25.6 per cent, respectively, for American troops, white and colored.

The following statement shows the causes of rejection among Porto Rican candidates examined for enlistment during the year, with ratios per thousand rejected:

| Cause of rejection. | Number rejected. | Ratio per 1,000. |
|---|---|---|
| Causes not physical | 7 | 241.38 |
| Diseases of the genito-urinary system, nonvenereal | 5 | 172.41 |
| Physical debility | 5 | 172.41 |
| Defects of vision | 3 | 103.45 |
| Hernia | 2 | 68.97 |
| Underweight | 2 | 68.97 |
| Defects of development except as shown in detail | 2 | 68.97 |
| Epidemic disease | 1 | 34.48 |
| Skin disease | 1 | 34.48 |
| Venereal disease | 1 | 34.48 |
| Total | 29 | 1,000.00 |

The principal causes of rejection (ratios per 1,000) in the order of their relative importance were defects of development, 310.35; diseases of the genito-urinary system, nonvenereal, 172.41; defects of vision, 103.45; hernia, 68.97; and venereal diseases, 34.48. There was no rejection for heart disease, one of the most important causes for rejection among white, colored, and Filipino recruits.

## SANITATION.

The only United States troops in Porto Rico at the beginning of the year were two companies of coast artillery; these were withdrawn in May leaving only the Porto Rico Provisional Regiment of Infantry, to which alone the following data apply:

*San Juan.*—Water supply is sufficient in quantity and of generally good quality. It is recommended that orders, at present in force, in regard to boiling all drinking water be continued.

*Henry Barracks.*—The surface drainage is reported very defective.

## HAWAII.

The mean strength of the troops serving in Hawaii during the year was 204, a number too small to afford an accurate basis of comparison. The only station was Camp William McKinley, Honolulu, and the garrison was composed of two companies of coast artillery, with the usual staff detachments.

The admission, death, and noneffective rates were 1,441.17, 9.80, and 43.86, respectively, as compared with 1,305.83, 6.44, and 46.32 for the United States proper. Nearly one-half of the noneffective ratio was for injuries, venereal diseases, and alcoholism.

One case of malarial fever was reported. In view of the statement which has been made that there are no anopheles mosquitoes in Hawaii and that malaria does not originate there, this case is of interest. Unfortunately nothing was stated as to the history of the case.

Tuberculosis was notable by its absence. Venereal diseases and alcoholism gave high admission rates, 161.76 and 63.73, respectively, per thousand of mean strength.

The nature of the dysentery and its origin was not stated. The cases of "fevers undetermined" were of interest in connection with reports of a fever neither malarial nor typhoid which is said to occur in Hawaii.

The 2 deaths were due to typhoid fever. There was no discharge for disability.

The most healthful month was November, with an admission rate of 59.63, and the least healthful, June, with a rate of 150.25 per thousand of strength. There was no one disease occurring in June of sufficient prevalence to explain the difference in the figures for the two periods.

As regards age, the highest admission rate occurred in men of 40 to 44 years, the highest death and noneffective ratios in men of 20 to 24 years. As regards length of service the highest admission and noneffective rates appeared in men in their second year of service, while as regards service in Hawaii the highest admission ratio was in men who had been in the island over one year.

## SANITATION.

*Camp William McKinley.*—Buildings and grounds are in good condition. At the hospital wastes are collected in ventilated cesspools which are emptied once or twice a week and contents removed to scows, in which they are carried 3 miles out to sea and dumped. At camp dry-earth closets and cesspools are in use. The former are emptied daily by contractors, contents removed 1¾ miles distant, and used for fertilizing purposes; cesspools are buried under the ground and have never been emptied. Liquid contents absorbed by soil, the solid remaining. Garbage at camp removed by scavengers and fed to pigs. Water supply for both hospital and camp is the city main, fed from reservoirs which collect rain from watersheds of hills back of the city of Honolulu and from artesian wells; quality excellent.

Three cases of typhoid fever occurred at Honolulu, all in the Twenty-eighth Company, Coast Artillery. The surgeon recommended that the mess rooms and kitchens of the two companies be thoroughly screened at once, as the near proximity of the sinks render contamination of the food by flies carrying the typhoid bacillus a probable occurrence. These recommendations were promptly carried out.

## CHINA.

The mean strength of the command serving in China during the year was 142 enlisted men, a number too small to afford an accurate basis of comparison. The only station was the United States legation at Pekin, Company B, Ninth U. S. Infantry, constituting the legation guard.

The admission, death, and noneffective rates, were 1,394.36, 7.04, and 37.23, respectively, compared with 1,305.83, 6.44, and 46.32 for the United States proper. There was no discharge for disability.

The rates for typhoid and malarial fevers, tuberculosis, venereal diseases, and alcoholism were all high as compared with the United States. Dysentery was notable by its absence. During July, August, and September there were 25 admissions for a fever diagnosed as "fever, remittent, causation undetermined." Concerning this fever the medical officer made the following remarks:

> The cases diagnosed as "fever, remittent, causation undetermined," were an acute illness lasting about four days, apparently infectious, marked by a moderate temperature, usually not above 102°, and general pains about the back, head, and extremities; sometimes initial nausea and vomiting; pulse slow during fever, not above 80 and as low as 58; constipation in every case.
>
> No involvement of the respiratory tract, skin, kidneys, or other organs. Repeated blood examinations were negative for malarial and other organisms, and showed a slight increase in polymorpho nuclear leucocytes. There were no relapses.

The 1 death reported at this station was due to drowning.

Excluding injuries, venereal diseases, and alcoholism, the highest rates were in January and the lowest in April. The cause of the high rate in January appears to have been the occurrence of an epidemic of mumps in that month.

As regards age, the highest admission and noneffective rates are shown to have occurred in men of 20 to 24 years. As regards length of service, the highest ratios were in soldiers of from two to three years' service, while as regards length of service in China the highest rates were in those of over one year's service.

## SANITATION.

No defect in sanitation was reported during the year.

## PHILIPPINE ISLANDS.

### *American troops.*

The mean strength of the command was 11,996, as against 17,523 for 1903. There were 20,246 admissions to sick report, 2 discharges for disability, 105 deaths, and 790.21 men constantly on sick report, equal to rates of 1,687.73, 0.17, 8.75, and 65.88, respectively. Ten deaths occurred in the United States of men whose commands were in the Philippines and who had been invalided home. This would increase the total number of deaths to 115 and the ratio per thousand to 9.59. The discharge rate was of no consequence, as nearly all disabled men are sent to the United States for discharge; all the other rates were considerably lower than for 1903, when they were 2,104.09 for admissions and 14.84 for deaths. The noneffective rate for 1903 is not available.

For 1904 the admission ratio for disease was 1,473.16, for injury 214.57; on the other hand, the death rate for injury, 4.92, was higher than that for disease, 3.83.

The principal causes of admission in order of their relative importance, with ratios per thousand, were venereal diseases 297.42, diarrheal diseases 237.16, malarial fevers 220.65, dengue 60.69, and bronchitis 39.50. Owing to a different arrangement of the statistics last year no comparison with 1903 is possible.

Diarrheal diseases led as causes of death with a ratio of 1.09; typhoid fever, heart disease, tuberculosis, and liver abscess following successively with rates of 0.42, 0.42, 0.25, and 0.25. As, however, many of the seriously ill were invalided home and died there, these figures represent only the deaths which actually occurred in the Philippines. The discharges for disability practically all occurred in the United States. Venereal diseases caused 37 per cent of the total noneffectiveness from disease.

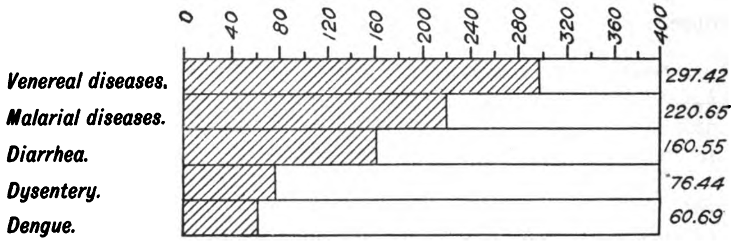
Under external causes there were 62 admissions for gunshot wounds with 9 deaths, equivalent to rates of 5.17 and 0.75 respectively; also, 609 admissions for wounds other than gunshot with 12 deaths, the proportions being 50.76 and 1. Nineteen cases of sunstroke without a death indicate that these cases were probably *heat exhaustion* and not *insolation*. Twenty-two deaths from drowning show the necessity for instruction of all enlisted men in swimming. Five soldiers died by suicide.

*Deaths among American troops serving in the Philippine Islands.*

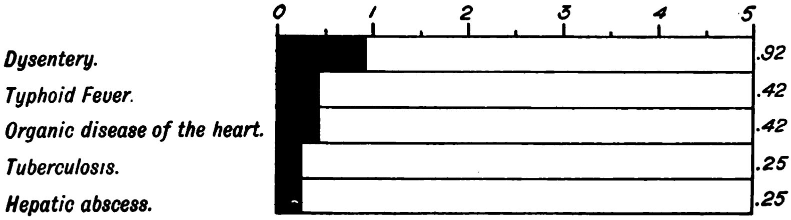
| Causes of deaths. | Number of deaths. | Ratios per 1,000 of— | |
|---|---|---|---|
| | | Mean strength. | Total deaths. |
| DISEASES. | | | |
| Chronic dysentery | 7 | 0.58 | 152.17 |
| Typhoid fever | 5 | .42 | 108.70 |
| Acute dysentery | 4 | .33 | 86.96 |
| Tuberculosis of the lungs | 3 | .25 | 65.22 |
| Organic disease of the heart | 3 | .25 | 65.22 |
| Hepatic abscess | 3 | .25 | 65.22 |
| Malarial fever, pernicious | 2 | .17 | 43.48 |
| Smallpox | 2 | .17 | 43.48 |
| Acute endocarditis | 2 | .17 | 43.48 |
| Enteritis | 2 | .17 | 43.48 |
| Bright's disease | 2 | .17 | 43.48 |
| Malarial fever, remittent | 1 | .08 | 21.74 |
| Purulent infection | 1 | .08 | 21.74 |
| Cancer of the pancreas | 1 | .08 | 21.74 |
| Cancer of the duodenum | 1 | .08 | 21.74 |
| Paralysis | 1 | .08 | 21.74 |
| Angina pectoris | 1 | .08 | 21.74 |
| Aneurism | 1 | .08 | 21.74 |
| Broncho pneumonia | 1 | .08 | 21.74 |
| Pneumonia | 1 | .08 | 21.74 |
| Acute intestinal obstruction | 1 | .08 | 21.74 |
| Acute nephritis | 1 | .08 | 21.74 |
| Total | 46 | 3.83 | 1,000.00 |
| INJURIES. | | | |
| Drowning | 22 | 1.83 | 372.88 |
| Killed in action | 21 | 1.75 | 355.93 |
| Suicides | 5 | .42 | 84.75 |
| Died of wounds received in action | 3 | .25 | 50.85 |
| Killed by escaping native prisoner | 3 | .25 | 50.85 |
| Shot by sentry | 1 | .08 | 16.95 |
| Dislocation cervical vertebræ | 1 | .08 | 16.95 |
| Compression of brain (accidental injury) | 1 | .08 | 16.95 |
| Acute narcotic poisoning (accidental) | 1 | .08 | 16.95 |
| Homicide | 1 | .08 | 16.95 |
| Total | 59 | 4.92 | 1,000.00 |
| Grand total | 105 | 8.75 | .......... |

*Charts showing the relative admission, death, discharge, and noneffective rates for the five diseases causing the highest rates in the Philippine Islands (white troops).*

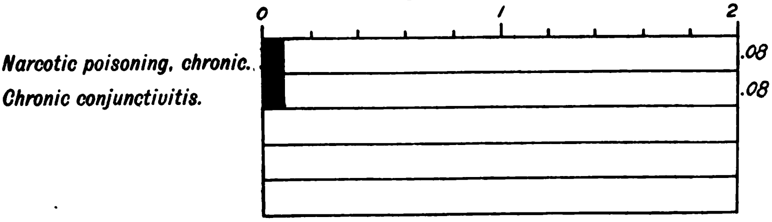
Admissions.



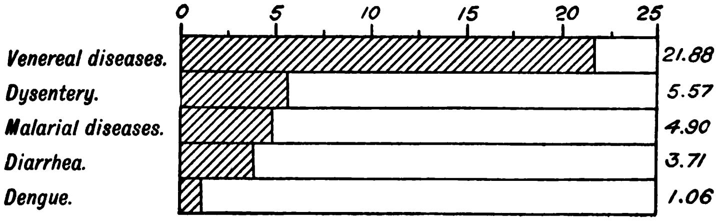
Deaths.



Discharges.



Noneffective.



### TYPHOID FEVER.

The admission rate for typhoid fever, 1.92, showed a decided improvement over that for 1903, 4.66. Cases were reported from 15 different posts, 9 in Luzon, 5 in Mindanao, and 1 from Guimaras. Camp Marahui had the largest number of cases.

### UNDETERMINED FEVERS.

There were 400 admissions for undetermined fevers, equal to a rate of 33.34 per thousand, as compared with 6.26 for the United States continental. It will be noted that over 50 per cent of these cases occurred in the last quarter of the year.

### MALARIAL DISEASES.

There was a decided reduction in the number of admissions for malarial diseases compared with 1903; the ratio was 220.65 per thousand. The highest proportions occurred in the months of March and May. The great majority of cases of malarial fever observed in the Philippine Islands were of the estivoautumnal type; of 464 positive examinations of the blood for malaria at the First Reserve Hospital, Manila, in 1903 and 1904, the parasite was estivoautumnal in 366. There was one admission for hemoglobinuric fever; in this case the parasite was estivoautumnal.

In the Department of Luzon the three stations which suffered most from malaria were Camp Stotsenburg, where the admissions were at the rate of 730 per thousand; Camp Wilhelm, 540 per thousand, and Camp Gregg, 525 per thousand. The three stations which suffered least were Camp Daraga, Camp Wallace, and Malate Barracks. In the Department of the Visayas the disease occurred in the following order of frequency: Camps Jossman, Connell, Warwick, Bumpus, and Downes. In the Department of Mindanao but three stations reported malarial fever as prevalent, and all showed a decided decrease as compared with previous years.

### SMALLPOX.

There were but 4 admissions for smallpox, with 2 deaths during the year.

### BERIBERI.

One case of beriberi was reported.

### ASIATIC CHOLERA.

The 1 case of cholera reported is open to doubt, as it was not bacteriologically confirmed. The last undoubted case among soldiers was in October, 1903. Cholera was officially declared as having disappeared from Manila in February, 1904, and from the provinces in April. Thus was brought to an end an epidemic which began in March, 1902, and the control and termination of which reflects the greatest credit upon medical officers of the Army. Not only did they protect the troops under their charge so effectively that an exceedingly small number were affected, compared with the civilian population among whom they lived, but they everywhere labored unceasingly and to good purpose in the fight against the disease among the natives.

### DIARRHEAL DISEASES.

The rates for diarrhea and dysentery, 160.55 and 76.44, showed an improvement over those for 1903. The highest rates for dysentery were found in July, August, and September, while those for diarrhea occurred one month earlier. In the Department of Luzon the stations which furnished the greatest number of cases of dysentery were Camps Daraga, Wilhelm, and Wallace; those which furnished the least, Camps Stotsenburg and McGrath.

### DENGUE.

Dengue gave an admission rate of 60.69, with no death.

### MALTA FEVER.

There were 2 admissions for Malta fever.

### TUBERCULOSIS.

The admission ratio for tuberculosis, 5.41, was a little higher than that for white troops in the United States. As in the United States, more than half of the cases occurred in soldiers in their first enlistment. About 12 per cent were in their first year of service.

### VENEREAL DISEASES.

A considerable increase was noted in the figures for venereal diseases in the troops on Philippine service over those of the preceding year. The proportions are also much higher than those recorded for the troops in the United States proper, the relative admission rates being 297.42 and 163.42, respectively.

### ALCOHOLISM.

The rate for alcoholism, 37.85, was considerably higher than that for the United States, 25.42.

### INSANITY.

The relative figures for insanity in the two countries were about the same.

### PNEUMONIA.

Pneumonia gave the very low admission rate of 0.58, as compared with 5.37 for the United States.

### LIVER DISEASES.

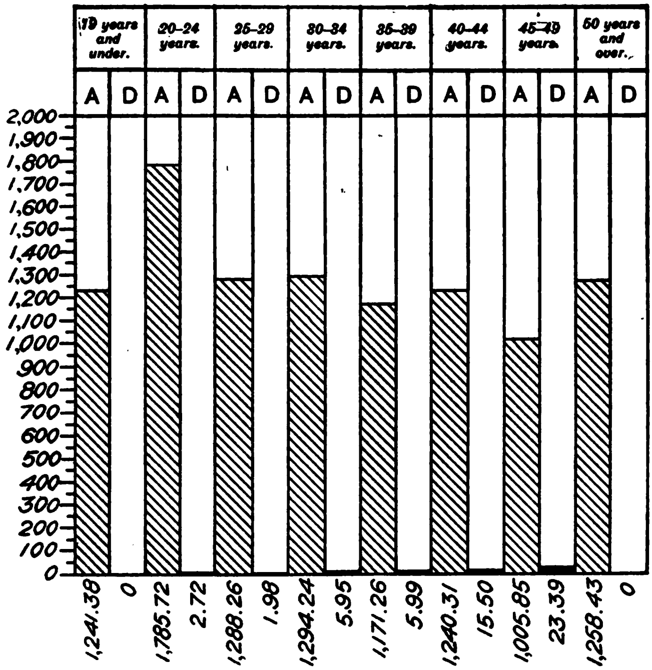
Liver diseases were most prevalent in November. The proportion for the year was 4.83.

## OTHER DISEASES.

The following diseases frequently found in certain tropical areas have not thus far been reported from our troops in the Philippines: Relapsing fever, kala-azar, Weil's disease, yaws, epidemic dropsy, pellagra, sleeping sickness, Bilharzia disease, endemic hemoptysis.

Of the departments Luzon had the highest admission rate for all causes and the lowest death and noneffective rates; the Visayas had the lowest admission ratio for all causes, and the lowest admission rate, excluding injuries, venereal diseases, and alcoholism; Mindanao had the highest admission rate, excluding injuries, venereal diseases, and alcoholism, the highest death and the highest noneffective ratios.

*Chart showing the relation of ages to admissions and deaths for disease in the Philippine Islands (white).*



Leaving out of consideration the islands with comparatively small mean strength, the island of Guimaras had the highest admission figure for all causes and the lowest death rate; the island of Cebu had the lowest admission ratio for all causes, and excluding injuries, venereal diseases, and alcoholism, and the highest death rate; the island of Mindanao had the highest admission rate, excluding injuries, venereal diseases, and alcoholism, and the second highest death rate; the island of Panay had the highest noneffective ratio for all causes, while Samar had the lowest.

Taking the ten largest posts as shown in International Table No. V,[a] the post having the highest admission rate was Camp Stotsenburg, Luzon, and the next highest Zamboanga, Mindanao; the lowest admission ratio, Camp Warwick, Cebu, and the next lowest, Camp Connell,

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[a] Omitted.

Samar. The highest proportion of deaths was noted at Zamboanga, Mindanao; the next highest at Camp Warwick, Cebu, and the lowest at the Manila posts.

In considering these figures it is to be borne in mind that troops were actively engaged on the islands of Mindanao and Jolo during the year.

Excluding injuries, venereal diseases, and alcoholism, the highest admission rate occurred in June, the highest death and noneffective ratios in July; the lowest admission, death, and noneffective figures were noted in February.

Taking six month periods, the highest admission rates occurred from May to October, inclusive, and the highest noneffective rates from June to November, corresponding roughly with the rainy season; the highest death ratios, however, belong to the period from March to August, inclusive.

It will be seen that the highest admission and the lowest death rates from disease occurred in soldiers under 30 years of age, while the lowest admission and the highest death ratios are recorded in men of from 45 to 49 years.

According to length of service the highest admission rate occurred in soldiers of from two to three years' service, and the lowest in those of less than one year's service; the highest death ratio in men whose service aggregated ten years and over, and the lowest in those in the second year of service.

### INVALIDED HOME.

The number of enlisted men invalided from the Philippine Islands in 1904 was 467, giving an invaliding ratio of 38.93 per thousand as against 56.44 for the previous year.

As in 1903, diarrheal diseases, tuberculosis, and venereal diseases led as causes of invaliding, the three classes of disease causing over 54 per cent of the total. Next in order of importance were injuries, insanity, and diseases of the ear. Of those sent home 10, or 2.14 per cent, died, 4 of them while en route; 12.42 per cent were discharged for disability; 23.98 per cent were returned to duty, and 44.32 per cent were remaining at the end of the year.

### *Filipino troops.*

With a mean strength of 4,610 there were 5,242 admissions to sick report, 27 discharges for disability, 103 deaths, and 147.74 men constantly noneffective, equivalent to rates of 1,137.09, 5.86, 22.34, and 32.05, respectively, as compared with 1,372.32, 10.23, and 21.51 for 1903. All the proportions were therefore lower except the death rate, which was slightly higher. Two-thirds of the death rate was due to injury, nearly all casualties in action.

The principal causes of admission for diseases in order of their relative importance, with ratios per thousand, were malarial fevers 368.99, diarrheal diseases 94.36, beriberi 74.62, venereal diseases 67.25, and bronchitis 57.70. Malarial fevers, diarrheal diseases, and beriberi showed a decided improvement over the figures for 1903, which were 531.22, 121.31, and 128.21, respectively. Venereal diseases have increased, the rate for 1903 being 55.55.

Tuberculosis had first place among diseases as a cause of death, with a rate of 2.82; beriberi, typhoid fever, malarial fevers, and diarrheal diseases follow in regular order, with rates of 1.52, 0.65, 0.43, and 0.22, respectively. The death ratio for tuberculosis was more than three times greater than for 1903, while the rate for beriberi was less than one-third; the former disease caused 35.29 per cent of all deaths from disease and the latter 20.52 per cent.

The principal causes of discharge were tuberculosis, rate 2.60, and beriberi, rate 1.30. Only 3 out of the total of 27 discharges were for disabilities not in the line of duty; only 1 discharge was for injury. Tuberculosis and beriberi caused 69 per cent of all the discharges for disease.

There were 525 admissions, 1 discharge, 68 deaths, and 13.49 constantly noneffective from external causes, equal to ratios of 113.88, 0.22, 14.75, and 2.93, respectively. There were 24 admissions for wounds, gunshot, with 11 deaths, equal to rates of 5.21 and 2.39, and 141 admissions for wounds other than gunshot, with 47 deaths, equal to rates of 30.59 and 10.20. Fifty-six men were killed in action and 25 wounded, equivalent to proportions of 12.15 and 5.42, respectively. Of the former, 5 were by gunshot, and of the latter, 17 were by gunshot. There were 2 cases of sunstroke, and no death by drowning. There were 2 suicides.

Excluding venereal diseases, alcoholism, and injuries, which are practically independent of seasonal influences, the highest admission figure was recorded in May, the lowest in December; the highest death rate in December, the lowest in June; the highest noneffective rate in January, the lowest in November; the six-months period from April to September, inclusive, had a much higher admission ratio and a considerably lower death ratio than the remaining six months.

## KILLED AND WOUNDED IN ACTION.

Fifty-six enlisted men were killed in action and 25 wounded. This unusual proportion of killed to wounded is explained by the fact that 47 of the dead were killed by cutting weapons in hand-to-hand fighting; of the 25 wounded in 9 the wounds were from cutting weapons, and 16 from gunshot. One scout officer was killed and none wounded.

## RECRUITING.

In this table is shown the results obtained from the examination of Filipino applicants for enlistment during the year, in both absolute and proportional numbers:

| | Number. | Ratio per 1,000 of Filipinos examined. |
|---|---|---|
| Examined | 4,185 | 1,000.00 |
| Accepted | 3,845 | 918.76 |
| Rejected on primary examination | 294 | 70.25 |
| Declined | 46 | 10.99 |

The number of enlistments among Filipinos during 1904 was far in excess of the accepted applicants for the preceding year, yet the ratio per thousand of those enlisted varied but little for the two years, being 938.31 and 918.76 for 1903 and 1904, respectively. These rates are also very high when compared with those of white and colored recruits, whose respective ratios of approved candidates for the past year were 658.2 and 665.6 per thousand of each class examined. This is explained by the fact that the Filipino recruits were not required to come up to the physical standard used in the Regular Army.

The following statement shows the ages of all accepted Filipino recruits and the proportion at each age per thousand:

| Ages. | Number. | Ratio. | Ages. | Number. | Ratio. |
|---|---|---|---|---|---|
| 18 years and under | 51 | 13.3 | 31 years | 96 | 25.0 |
| 19 years | 45 | 11.7 | 32 years | 61 | 15.9 |
| 20 years | 70 | 18.2 | 33 years | 63 | 16.4 |
| 21 years | 590 | 153.4 | 34 years | 40 | 10.4 |
| 22 years | 551 | 143.3 | 35 years | 23 | 6.0 |
| 23 years | 419 | 109.0 | 36 years | 12 | 3.1 |
| 24 years | 460 | 119.6 | 37 years | 10 | 2.6 |
| 25 years | 350 | 91.0 | 38 years | 19 | 4.9 |
| 26 years | 245 | 63.7 | 39 years | 13 | 3.4 |
| 27 years | 191 | 49.7 | 40 years and over | 34 | 8.8 |
| 28 years | 220 | 57.2 | | | |
| 29 years | 158 | 41.1 | Total | 3,845 | 1,000.0 |
| 30 years | 124 | 32.2 | | | |

The proportion of approved candidates for enlistment under 24 years of age is 56.8 per cent for the year 1904, 96, or 2.5 per cent, of which were under 20 years of age at time of entry into service, while 21 years is the age at which the largest number were accepted.

As was to be expected, the height of the highest proportion of Filipinos enlisted was materially less than that for the other races, being 5 feet 3 inches for 18.8 per cent, compared with 5 feet 7 inches for the other classes. The height of more than half of the approved Filipino applicants was under 5 feet 4 inches, while not one was over 6 feet.

Between 110 and 119 pounds was recorded as the weight for the 30.8 per cent, the highest proportion at all ages, of Filipino approved applicants for enlistment during the year. It will be noted that 147 Filipino recruits attained the weights of the highest proportion of white and colored men at all ages enlisted during the last calendar year, while of the 3,845 Filipinos enlisted but 43 weighed 150 pounds or over and 75 were taken into the service weighing 99 pounds and under.

The following table[a] shows the chest measurement of accepted Filipino recruits with ratios per thousand, also the relation of age to chest measurement in both absolute and proportional numbers.

In fifteen enlistments of native Filipinos the minimum chest measurement of 26 inches was recorded, while 31 inches was the measurement of the highest proportion of accepted candidates at all ages, the proportion being about one-fourth of the total enlistments.

The principal causes of rejection among these recruits, ratios per 1,000, in order of their importance, were: Defects of development, 248.29, heart disease, 180.27; venereal diseases, 74.83; diseases of the respiratory system, except tuberculosis, 71.43, and defects of vision, 68.03.

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[a] Omitted.

## PREVALENCE OF DISEASE BY RACES.

In making this comparison it is to be borne in mind that the native troops were serving in their own country under conditions natural to them but inimical to the white race, and that American soldiers excused from any portion of their military duty, no matter how trivial the cause, must be placed on sick report, while this is not the case with Filipino soldiers.

All the rates except the death rate were much lower for Filipino than American troops, while the death ratio was nearly three times as great among the Filipinos. The higher death rate in the latter race was due to the fact that the Filipinos were more largely employed in active service, and had 12.15 men per thousand killed in action, against 1.75 per thousand for white troops.

The diseases more prevalent among American troops, with the admission rates per 1,000 for each, are shown in the following table:

| Disease. | American. | Filipino. |
|---|---|---|
| Liver abscess | 0.42 | ........ |
| Alcoholism | 37.85 | 1.52 |
| Insanity | 1.75 | .87 |
| Appendicitis | 3.50 | .22 |
| Measles | 1.50 | .22 |
| Dengue | 60.69 | 12.15 |
| Venereal diseases | 297.42 | 67.25 |
| Dysentery | 76.44 | 17.35 |
| Diarrhea | 160.55 | 76.58 |
| Typhoid fever | 1.92 | .87 |
| Heart disease | 1.75 | 1.08 |

The diseases more prevalent among the Filipinos are shown in the following table:

| Disease. | Filipino. | American. |
|---|---|---|
| Leprosy | 0.43 | ............ |
| Beriberi | 74.62 | 0.08 |
| Pneumonia | 3.25 | .58 |
| Malarial fever | 368.99 | 220.65 |
| Tuberculosis | 7.81 | 5.41 |

The Filipinos had a much higher ratio for deaths from external causes, this being due to the fact that a larger proportion of Filipino Scouts than of American soldiers were on field service, the respective proportions being as follows: Admissions, Filipino, 113.88; American, 214.57; deaths, Filipino, 14.75; American, 4.92. The Filipinos had an admission rate for sunstroke of 0.43 as against 1.58 for Americans, and one of zero for drowning against 1.83 for Americans.

The highest death rate among the Filipinos occurred in the period from October to March, inclusive, while the highest death rate among American soldiers was noted in the period March to August.

## SANITATION.

The following extracts are taken from the report of the chief surgeon, Philippines Division, for the calendar year 1904:

I desire to invite attention to the fact that throughout the year 1904 more than 110 different localities were garrisoned by the United States Army in the different islands of the Philippine Archipelago. Out of that number scarcely 30 are military posts as generally understood—that is, stations where the troops are sheltered in government buildings located on ground owned or leased by the United States and controlled by the military authorities. The other 80 or more stations are almost without exception Philippine native towns of varying importance, each one garrisoned by a force of Philippine Scouts ranging in size from a small detachment to a whole company, where troops occupy rented buildings and exercise no control whatever on the affairs or concerns of the locality. They are, moreover, liable to frequent changes, a majority of the towns being garrisoned for a short period only. A discussion of the sanitary conditions of such places is uncalled for in a strictly military report, and would be not only an extremely tedious iteration of closely similar data, but singularly unprofitable in every respect. Our remarks must be confined to military posts proper, occupied largely by white troops.

The military stations proper, or posts of the division, all occupied by white troops, are:

| Stations. | Mean strength, 1904. |
|---|---|
| DEPARTMENT OF LUZON. | |
| Camp Gregg, Pangasinan | 264 |
| Camp Wallace, Union | 330 |
| Camp Stotsenburg, Pampanga | 764 |
| Malahi Island, Laguna | 364 |
| Camp Eldridge, Laguna | 93 |
| Fort William McKinley, Rizal | 211 |
| Cuartel de Meisic, Manila | 334 |
| Santa Mesa Garrison, Manila | 368 |
| Cuartel de Espana, Manila | 375 |
| Malate Barracks, Manila | 332 |
| Pasay Barracks, Manila | 400 |
| Camp McGrath, Batangas | 475 |
| Camp Wilhelm, Tayabas | 254 |
| Camp Daraga, Albay | 400 |
| DEPARTMENT OF THE VISAYAS. | |
| Iloilo, Panay | 184 |
| Camp Jossman, Guimaras | 927 |
| Camp Connell, Samar | 693 |
| Camp Warwick, Cebu | 269 |
| Camp Bumpus, Leyte | 286 |
| Camp Downes, Leyte | 244 |
| DEPARTMENT OF MINDANAO. | |
| Zamboanga | 252 |
| Jolo | 598 |
| Camp Overton | 338 |
| Camp Marahui (now Keithley) | 719 |
| Camp Vicars | 278 |
| Malabang | 517 |
| Parang | 155 |
| Cottabato | 178 |

The general sanitary condition of stations in the division is almost uniformly reported as being good. Inspectors-general in some of their reports called attention to minor defects existing in this respect at some of the stations, all of which were promptly remedied when practicable. At temporary stations the conditions, as already noted, are usually not within the control of the military authorities. Instructions issued from division headquarters regarding the use of unsterilized food and drinks have been carried out as far as has been possible for post commanders to do so. The larger posts are provided with distilling plants for distilling water; at stations unprovided with distilling plants facilities are furnished for boiling the water; troops operating in the field likewise boil all their drinking water. It has been often said that it is impracticable to sterilize sufficient water for troops in the field. The commanding-general, Department of Mindanao, has been able to accomplish this end without difficulty, necessary utensils being furnished by the quartermaster's department. The chief surgeon of that department ascribes the diminution of dysentery and gastro-intestinal disorders among the troops in the Department of Mindanao to these precautions.

The water supply of the posts in the division is usually from streams; in a few instances from surface wells, and in one instance, Camp Stotsenburg, from driven wells; in another instance, Fort William McKinley, from artesian wells. In the latter instance the water is used for drinking purposes without sterilization; in the case of Camp Stotsenburg the water is boiled for drinking purposes. Bacteriological examination of these deep wells has demonstrated their freedom from pathogenic organisms.

There have been few important changes in the sanitary conditions of the posts in the division. At the permanent posts the buildings are generally reported as being in good state of repair and as offering proper protection to the troops. Those posts in which changes have been noted in the sanitary condition are as follows:

*In the Department of Luzon.*—Camp Eldridge, Los Banos, Laguna, a new post was built and the troops removed from an old convent which was used as barracks with satisfactory results. The new post is reported as being well situated and well drained. When first occupied mosquitoes were extremely numerous, owing to the fact that the post is surrounded by tall grass; the cutting of this for a distance of 100 yards beyond the buildings reduced their number markedly.

At Fort William McKinley recommendations have been made regarding drainage. This post is still under construction and will be provided in due course of time with sewers, and all the recommendations made with reference to drainage will probably be remedied eventually.

At Camp McGrath the surface drainage has been improved, cement walks have been laid, dry-earth closets have been removed from tents to permanent sheds having floors, lavatories with cement floors and drains have been erected, breeding places and shelters for mosquitoes have been practically abolished by drainage or filling in of surface depressions, and by cutting tall grass and shrubbery, the use of mosquito bars has been enforced by night inspection, a new water supply has been secured from a spring on the reservation, which yields 200,000 gallons per day; this water is to be piped to the post.

Camp Wilhelm, which bears a reputation of being the second post in the Department of Luzon in order of admission rate for malaria, is surrounded by marshy land and dense underbrush, which breed and protect mosquitoes. The preventive measures adopted here have been the filling in, as far as practicable, of all depressions under the jurisdiction of the military authorities. Those pools which it has been found impossible to drain have been oiled. This post, being on leased land, will probably be removed elsewhere.

Other recommendations made from this office on special sanitary reports have been as follows:

That the reservoir at the convalescent hospital, Corregidor Island, be repaired so as to prevent loss, in view of the danger of insufficiency of water supply; that the drains for surface water be repaired, and that a water-closet system be installed in place of the earth closets now in use.

The second recommendation has been favorably acted upon and the work in that connection is now under way; the other questions are still under consideration.

The water supply at the pumping station is obtained from a spring. This spring is reported as being well protected from contamination by masonry work, and the water was used unboiled because it had been analyzed and reported as being pure. As it is not believed that any natural water, except perhaps artesian water, in these islands is free from amebæ, it was recommended that instructions be issued to boil this water for drinking.

*In the Department of the Visayas.*—The surgeon at Camp Hartshorne, Samar, reported that recommendations had been made to grade and fill certain areas which retain water and were breeding places for mosquitoes. These recommendations had not been completely carried out. The attention of the department commander has been called to the defects.

It was reported that the water used for drinking at Camp Jossman was passed through Forbes-Waterhouse sterilizers and then distributed; as the experience in this division with these sterilizers has not been satisfactory, it was recommended that a distilling plant be erected.

At Camp Warwick the excreta are disposed of by water-carriage system emptying into the river bed near the post hospital, and remains upon the shore until washed away by the rains. It was recommended that the sewer be made to enter directly into the sea in order to remove the above objection. The recommendation has been referred by the division commander to the department commander for action.

*In the Department of Mindanao.*—Two new and commodious sets of board barracks with galvanized-iron roofs have been erected at Zamboanga, in which the men are reported as being more comfortably housed. A new hospital has been erected at this station during the year. This hospital has accommodations for 60 patients, and is said to be well adapted to the needs of the post. The command at this station consists of seven companies, and, though the hospital is not designated officially as such, it is to all intents and purposes the base hospital for the Department of Mindanao. The surgeon at this station recommended the removal of the post to a more elevated site, giving as his reasons that he considered the present site low, damp, malarial, and insanitary; this recommendation was disapproved by the department commander on the ground that the health record of Zamboanga is a good one. As far as known to this office, Zamboanga has always been considered one of the most healthful stations in the division.

Camp Overton is a new station, first occupied by its present strength of garrison in March, 1904. The buildings are of a temporary character, and the future of this post is still unknown. The surgeon of the post reports that there has been a great reduction in the number of malarial fevers and diarrhea in the command as compared with the previous year, at which time this same strength of command was stationed in the town of Iligan. An outbreak of dysentery in September he ascribes to the use of imperfectly sterilized drinking water. This drinking water was simply passed over the coils of steam pipe in the condenser of the ice plant. The outbreak ceased upon the discontinuance of the use of this water and its substitution by water which had been thoroughly boiled. He also recommended the installation of a more adequate water supply, which recommendation is still under consideration.

Camp Marahui reports an increase of diarrhea and dysentery and a diminution of malarial fevers as compared with the previous year. The surgeon gives no explanation regarding this increase. He states that strict orders have been issued in regard to the sole use of boiled water for drinking, but it appears to be impossible to compel their strict observance. This post also reports five cases of typhoid fever, contracted at a substation, which, in the opinion of the surgeon, were caused by swallowing river water while bathing. The hospital at this station consists entirely of tents. Plans and estimates for the construction of a board hospital have been approved, and it is believed at this date the work has already been begun. The usual recommendations regarding the removal of breeding places of mosquitoes have been made and carried out at this post.

The surgeon at Malabang has made many recommendations from a sanitary standpoint, nearly all of which have been promptly carried out. Among these recommendations he reports a diminished sick report by the removal of the men from under canvas into barracks. He also reports that the post exchange has conduced to the physical, mental, and moral improvement of the men. He states that the enforced use of mosquito bars has resulted in a diminution in the amount of malaria at that post. He also refers to the fact that after orders had been issued requiring the boiling of underclothing, dhobie itch, which appeared to infect men who had been in the field as well as those who had not been in the field, was diminished.

## HEALTH OF THE TROOPS ON TRANSPORTS.

During the year 1904 7,566 enlisted men left the United States on transports for passage to foreign stations and 7,524 returned from foreign stations.

The army transports were the most healthful places for troops, with an admission ratio of 466.63, a death rate of 5.61, and a noneffective rate of 37.77 per thousand of strength.

## MEDICAL OFFICERS, UNITED STATES ARMY.

The number of medical officers allowed by law is 322; the number in service June 30, 1905, was 303, leaving 19 vacancies at that date.

The following table shows the loss of medical officers during the fiscal year:

| Cause. | Colonels. | Lieutenant-colonels. | Majors. | First lieutenants. | Total. |
|---|---|---|---|---|---|
| Commission vacated by new appointment | 1 | | | | 1 |
| Retired from active service | 1 | 2 | 2 | 2 | 7 |
| Resigned | | | | 1 | 1 |
| Died | | | | 2 | 2 |
| Honorably discharged | | | | 1 | 1 |
| Aggregate | 2 | 2 | 2 | 6 | 12 |

There have been promoted during the year 2 lieutenant-colonels, deputy surgeons-general, to be colonels, assistant surgeons-general; 4 majors, surgeons, to be lieutenant-colonels, deputy surgeons-general; 6 captains, assistant surgeons, to be majors, surgeons; 8 first lieutenants, assistant surgeons, have been advanced to the rank of captain after five years' service, in accordance with existing law. Eight appointments have been made in the grade of assistant surgeon, with rank of first lieutenant, 4 of whom were appointed July 6, 1904, having been examined during the preceding fiscal year. Five first lieutenants were examined and 4 reexamined for advancement to the rank of captain; 1 of the latter failed to qualify and was honorably discharged, as provided by the act of October 1, 1890; the others were found qualified and advanced as above stated.

The bill to increase the efficiency of the Medical Department of the Army, which was reported favorably by the Senate Military Committee during the last session of Congress, was passed without change by the Senate January 5, 1905. On January 9, 1905, the President of the United States sent the following special message to Congress urging the passage of the bill:

*To the Senate and House of Representatives:*

I have, in a former message, stated to the Congress my belief that our Army need not be large, but that it should in every part be brought to the highest point of efficiency. The Secretary of War has called to my attention the fact that the act approved February 2, 1901, which accomplished so much to promote this result, failed to meet the needs of one staff department in which all of our people are peculiarly interested, and of which they have a right to demand a high degree of excellence. I refer to the Medical Department. Not only does a competent medical service, by safeguarding the health of the Army, contribute greatly to its power, but it gives to the families of the nation a guaranty that their fathers, brothers, and sons who are wounded in battle or sicken in the camp shall have not only skilled medical aid, but also that prompt and well-ordered attention to all their wants which can come only by an adequate and trained personnel.

I am satisfied that the Medical Corps is much too small for the needs of the present Army, and therefore very much too small for its successful expansion in time of war to meet the needs of an enlarged Army and in addition to furnish the volunteer service a certain number of officers trained in medical administration. A bill which, in the opinion of the Secretary of War, of the late Secretary of War, and of the General Staff of the Army, supplies these deficiencies was introduced at the last session of Congress, and is now before you. I am also advised that it meets the cordial approval of the medical profession of the country. It provides an organization which, when compared with that of other nations, does not seem to err on the side of excessive liberality, but which is believed to be sufficient. I earnestly recommend its passage by the present Congress. If the Medical Department is left as it is no amount of wisdom or efficiency in its administration would prevent a complete breakdown in the event of a serious war.

I transmit herewith a memorandum which has been prepared for me by the Surgeon-General of the Army, and also the remarks of the former and of the present Secretary of War with reference to this bill.

* * * * * * *

THEODORE ROOSEVELT.

WHITE HOUSE, *January 9, 1905.*

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[Memorandum for the President—The bill to increase the efficiency of the Army.]

WAR DEPARTMENT,
OFFICE OF THE SURGEON-GENERAL,
*Washington, December 7, 1904.*

The fact that mortality from disease in armies in war time greatly exceeds that from losses in battle is well known. The noneffective rate from sickness is even more greatly in excess of that from wounds. The British army in the Peninsula, in spite of the many bloody battles, lost three times as many men from disease as from wounds. The infant French Republic was saved at Valmy more by the paralysis of

Prussian efficiency by ravage of disease than by that rather bloodless victory. General Scott in the Mexican war lost by disease one-third of his effective strength. The loss from disease in the civil war was more than double that from the casualties of battle. The military efficiency of newly raised armies is specially liable to be gravely compromised or even destroyed from this cause.

The three primary duties of the Medical Department are:

1. To preserve the effective strength of armies (military sanitation).
2. To care for the sick and wounded.
3. To conduct the administrative work of the department.

To carry out these objects requires a highly specialized and complex organization and a numerous trained personnel. Military sanitation is now recognized to be a well-marked specialty in medicine of which the average practitioner knows little more than he does of the methods of military medical administration. The second duty is that for which civilian physicians can be used to advantage, while the first and third must in the main be in the hands of trained medical officers in order to secure efficiency. The standard of what is regarded as a satisfactory degree of efficiency in all of these directions has been greatly raised in late years.

In the Spanish war the country was scandalized by a monthly death rate from disease which rose from 2.15 per thousand in July to 4.08 in August, but fell again to 2.45 in September. During the civil war a higher death rate from disease than the highest maximum above mentioned persisted for many months, reaching in the spring of 1862 a maximum more than double it, without creating half as much popular clamor.

Nor would such occurrences be possible now in civilized warfare as for 600 wounded to lie for more than ten days on the battlefield, as happened after the second battle of Bull Run, on August 30, 1862, when many of the wounded died of starvation. That this was not one of the unavoidable horrors of war, but was, as stated by the Surgeon-General in reporting these facts, due to defective medical organization is evidenced by the fact that after the organization of the ambulance service of Letterman such occurrences ceased in the Army of the Potomac. After the great battles of Fredericksburg, December 13, 1862, and Chancellorsville, May 2, 1863, for instance, although the army was defeated, the field was cleared of wounded without confusion or delay.

The public sentiment of the civilized world therefore demands better organization and higher efficiency for the medical department of armies than at any time heretofore. Other nations, including even so poor a nation as the Japanese, are willing to pay the cost of increased efficiency in the shape of a large and well-organized medical service, and it is not to be believed that Congress or the American people will refuse for our Army what is demonstrated to be essential to avoid future failure and insure efficiency. For medical efficiency a certain number of trained medical officers is necessary to direct matters of military sanitation, and, in the words of Mr. Root, "to conduct the administration of the great and complicated medical service." The measure of this number is given by the Secretary of War in his report for this year as follows (p. 25):

"It is evident that a staff department which has a personnel insufficient to perform the duties required of it in time of peace can not be successfully expanded to meet the increased responsibilities of war. The commissioned personnel of the Medical Department is nearly 200 short of the number required to perform its work at present, and the deficiency has to be made good by the employment of civilian physicians under contract. This is an expensive and unsatisfactory expedient in time of peace, while in time of war it heavily handicaps the efficiency of the Department."

This principle was not recognized in the reorganization of the Army in 1901. The increase in the Medical Department at that time was so inadequate that the proportion of medical officers to the army at large was not increased, but greatly diminished and was made considerably less than the proportion existing at the beginning of the Spanish war or the civil war—this in spite of the recommendation of the Dodge Commission that the regular corps be increased.

Instead of giving an advocate's discussion of the bill now before Congress, I prefer to refer the President to the impartial opinion of the experts of the Third Division of the General Staff as given in their report on it made to the Chief of Staff, which is to be found on pages 6, 7, and 8 of the report of the Senate Military Committee. (Report No. 2420.)

The attention of the President is especially asked to the following points:

The Army is to-day officered for a strength of 100,000 men except the Medical Department, which is only sufficient for 42,000.

An adequate increase in the Medical Corps was recommended by the Dodge Commission.

This bill offers, in the words of Secretary Taft, "a complete workable system."

With a less number than that asked for, the Medical Department can not perform the duties with which it is charged by Army Regulations in time of peace, or be successfully expanded to meet the increased labors and responsibilities of war.

With a less proportion in the higher grades it can not attract properly qualified candidates to fill the vacancies created.

The Reserve Corps constitutes an eligible list of competent civil physicians who will reinforce the regular Medical Corps in time of war or other emergency.

The increase of cost is, when the enlargement is completed four years hence, only a little over 4 per cent above the present cost of the Medical Corps, while next year it will be actually diminished under this act.

The increase of efficiency is as 320 is to 450, or about 40 per cent.

This bill has received the rigid scrutiny of the General Staff, and the approval of Secretary Root, of Secretary Taft, of the Military Committee of the Senate, and of the American Medical Association.

Respectfully submitted.

R. M. O'Reilly,
*Surgeon-General.*

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War Department,
*Washington, January 30, 1904.*

I heartily approve this bill in principle. I consider that it will be greatly to the benefit of the service to abandon the employment of contract surgeons and substitute in their place regular commissioned officers. I do not think the number to which it is proposed to increase the Medical Corps is at all excessive. It seems to me that the presentation of the case by the Surgeon-General in regard to the necessities of skilled administration of the medical service in time of war is conclusive. It will be easy in time of war to secure an adequate number of physicians competent to treat the sick and wounded, but it will be impossible to secure medical men competent to conduct the administration of the great and complicated medical service unless they are specially trained in time of peace. The lack of a sufficient number of such trained officers in the past has caused untold suffering and the sacrifice of many thousands of valuable lives. It is our present duty to see to it that such a condition shall never exist again. I believe that that can be accomplished only by following the course which has now been indicated by the Surgeon-General and approved by the General Staff.

Upon the single question of the relative proportion of majors, lieutenant-colonels, and colonels which should properly be accorded to the Medical Corps, the Surgeon-General wishes to ask reconsideration by the General Staff. That single question, with the assent of the Chief of Staff, will accordingly be relegated to the General Staff for further consideration. Upon all other questions I approve the bill in detail.

Elihu Root, *Secretary of War.*

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War Department,
*Washington, February 18, 1904.*

Sir: I have the honor to transmit herewith a bill to increase the efficiency of the Medical Department of the United States Army, together with the approval by my predecessor, Secretary Root, of the bill in every part except as to the relative proportions of majors, lieutenant-colonels, and colonels which should properly be accorded to the Medical Corps.

The question was remitted to the General Staff for further consideration, and has been returned with the recommendation that the number of colonels be limited to 12, the lieutenant-colonels to 18, with 110 majors and 300 captains and first lieutenants; whereas the recommendation of the Surgeon-General is that the colonels number 20, the lieutenant-colonels 20, majors 110, and captains and lieutenants 300.

It appears that the division of the General Staff to which the bill was referred approved the proportion of colonels and lieutenant-colonels as recommended by the Surgeon-General, but that the War Department General Staff as a body, when the exact point was submitted to them, made the recommendation as above. General Chaffee was not present, I am informed, at the meeting of the General Staff, and possibly did not have the advantage of all the statements which were made with reference to the proper number of medical officers for each tactical unit in the field. Certainly the evidence introduced by the Surgeon-General shows that the number necessary for each tactical unit is considerably greater than that which must have been assumed by General Chaffee in the conclusion which he reached. Of course, I must differ from the opinion of the General Staff and the distinguished chief of that body with great diffidence in view of the short time that I have been in the Department. I have, however, read the arguments carefully of the Surgeon-General and the statement of the Third Division of the General Staff, and also of the Chief of Staff, and I am bound to say that it seems to me that the arguments of the Surgeon-General substantially outweigh those advanced by the Chief of Staff. The Surgeon-General's report shows a complete workable system which the amendment by the General Staff truncates and destroys the symmetry of. Then, too, the prospect of promotion which the increased number in the higher grades offers to those who enter the service seems to be absolutely essential to procuring good material for the Medical Corps. The increased expense in securing a proper medical education in modern days, as shown by lengthening of the term of preparation from two to four years, and the great professional rewards in civil life make it highly important that there be offered a due prospect of promotion to young men of ability to induce them to enter the corps.

In deference to the opinion of the General Staff, however, I have concluded to recommend a reduction in the number of colonels and an increase in the number of lieutenant-colonels, so that the bill should provide for 16 colonels and 24 lieutenant-colonels, and this I do after a conference with the Surgeon-General, who is willing to accept the amendment.

I do not approve that amendment to the law which limits the examination of a lieutenant-colonel, necessary to his promotion to a colonelcy, to an examination of his physical condition, his moral character, and his past record in the service, and it seems to me that the examinations ought to be continued to the highest rank, except that of the Surgeon-General, which grade is filled, of course, only by selection. Such a requirement will have the effect of preventing the upper grades from being regarded as places of leisure and as not entailing the hard enthusiastic work which is found in the lower ranks.

I have the honor to recommend the passage of the bill amended as suggested. I believe it to be of the utmost importance in securing a proper and efficient Medical Corps.

I accompany this letter with the bill and with the communications received by me from the Surgeon-General, the Third Division of the General Staff, and the Chief of Staff.

Very respectfully,

WM. H. TAFT,
*Secretary of War.*

The CHAIRMAN COMMITTEE ON MILITARY AFFAIRS,
*House of Representatives.*

[NOTE.—The bill as finally sent to Congress was altered so as to be in accord with the views of the Secretary of War as expressed above.]

The House Military Committee took up the consideration of the bill January 9, 1905. On February 17, 1905, the committee reported the bill favorably, but with amendments. It was, however, found impossible to have the bill called up in the House during the closing days of the session.

It is earnestly hoped that favorable action may be obtained at the next session of Congress on this bill, the passage of which means so much to the efficiency of the Army.

## ARMY MEDICAL SCHOOL.

The ninth session of the school began October 1 and ended April 11, 1905. The student body comprised ten junior medical officers, three student candidates, and eight medical officers of the militia, the latter admitted under the provisions of the Dick bill.

The Alexander H. Hoff memorial gold medal was awarded to Dr. William A. Duncan, a student candidate; the next two places on the honor roll were also held by student candidates, Herbert C. Gibner and Earl H. Bruns, respectively.

The graduating exercises were held at the Army Medical Museum, April 11, 1905. The following is an extract from the report of Col. C. L. Heizmann, assistant surgeon-general, U. S. Army, president of the faculty:

> The schedule is deemed amply sufficient for students who have been commissioned and have had some service at military posts. A larger and fuller course in administrative duties, however, is advisable for student candidates and officers of the militia.

This will be provided in the next session, the duration of which will be that contemplated by the circular of information, Office of the Surgeon-General, June 21, 1904, viz, eight months instead of six. There will be an opportunity then, also, to enlarge the scope of some other subjects, bacteriology, pathology, and hygiene, so that they may be completed during the session of the school and their repetition in the final examination for commission be avoided. Likewise a more extensive course in physics and in chemistry, from elementary to analytical, ending by a school examination, would seem to justify the omission of that subject from the preliminary examination to enter the school.

Regarding the students the school is now in a transition state. Originally and from its establishment all were officers who had no particular incentive to study. Failure in one or all of the branches taught carried no penalty. During this session the body of students comprised ten such officers, three student candidates, and eight militia officers. Those of the first kind showed at the earlier stages only a perfunctory desire to be benefited, either to graduate with honor (an average of 90 per cent) or to graduate at all (an average of 80 per cent). Later there was improvement, and yet the result was that only two attained the honor, and of the remainder, though all were declared proficient, several secured positions in the class not in accord with their positions in the Army.

The three student candidates, having everything to gain, captured the highest places, in spite of the fact that they had much more additional work in order to meet the requirements of the final examination for commission, thereby proving the wisdom of the radical change from the old system of securing medical officers. Having watched their conduct, habits, attention to duty, and appreciated their eminent success, I have no doubt that hereafter the Medical Department will get by the new system a superior class of officers.

At this session, too, was inaugurated the training of medical officers of the militia of the States in everything pertaining to military medicine as distinct from naval, municipal, State, and civil medicine, etc., in order that under the Dick law they might become qualified in the emergency of war to perform all the duties of military surgeons of the national Army. If my interpretation of the purpose is correct, I regret to report that the result was not satisfactory. All these officers were studious and earnest, and all would have contributed to the sanitary and disciplinary education of the organizations to which they belong, had they returned to them. The majority, however, developed an intention to use the school as a means of employment in the regular establishment, thus to deprive their States of their services. One succeeded in receiving a commission in the Army and two secured contracts. This result is interesting in demonstrating the need of some regulation by which the purpose of the law would be fulfilled in greater part and at the same time secure for the regular and volunteer forces the best material possible.

This last point will be attained by requiring all militia medical officers who have served one year as such, and who have been recommended by the governors of their respective States, to pass an entrance examination similar to those exacted of line officers by the Artillery School and the Infantry and Cavalry schools.

The school having acquired additional rooms, can now accommodate a maximum of 50 students.

## CONTRACT SURGEONS, UNITED STATES ARMY.

There were 182 contract surgeons in service at the close of the fiscal year, June 30, 1904. During the past fiscal year contracts were made with 37 physicians, while 59 contracts were annulled and 3 were terminated by death, leaving 157 in service June 30, 1905. Of the 37 contracts made, 17 were merely renewals for definite terms of contracts already in force, and nearly all of the remaining 20 were with those having former creditable service as contract surgeons or volunteer medical officers. The net loss in contract surgeons for the fiscal year was 25, and the number remaining in service is the lowest since July, 1898.

Contract Surg. Samuel Turner died of cerebral sclerosis, near Fargo, N. Dak., December 11, 1904; Contract Surg. Joseph A. O'Neill was killed by ladrones at San Francisco de Malabon, Cavite, Philippine Islands, January 24, 1905, and Contract Surg. Frederick W. Richardson died of wood-alcohol poisoning at Ligao, Albay, Philippine Islands, January 26, 1905.

## CONTRACT DENTAL SURGEONS, UNITED STATES ARMY.

Thirty dental surgeons are allowed by the act of Congress approved February 2, 1901, and this number has been continuously employed under contract during the fiscal year ended June 30, 1905. Two contracts were annulled, and in each case the vacancy was filled the next day. Fourteen dental surgeons are at present serving in the Philippine Islands and 16 in the United States.

The following tables of dental statistics show that the dental surgeons have continued to perform valuable work throughout the year. In the Philippine Islands 996.21 cases per thousand of mean strength received dental treatment and operations were performed to the extent of 1,052.43 per thousand compared with 576.24 and 508.22, the corresponding figures for the United States.

The number of teeth affected by dental caries in white troops serving in the United States was 376.08 per thousand men, compared with 367.50 for the negro troops and 73.53 the rate for Filipino troops so serving. In the Philippine Islands the number affected in white troops was 884.90 per thousand mean strength, while 31.71 per thousand of the native scouts were treated for dental caries:

*Dental and oral diseases.*

| | United States (continental) except Alaska. | | Philippine Islands. | | Total. | |
|---|---|---|---|---|---|---|
| | Number. | Ratios per 1,000 of mean strength. | Number. | Ratios per 1,000 of mean strength. | Number. | Ratios per 1,000 of mean strength. |
| Cases admitted to treatment | 26,431 | 567.24 | 17,082 | 996.21 | 43,513 | 682.63 |
| Operations performed | 23,681 | 508.22 | 18,046 | 1,052.43 | 41,727 | 654.61 |

*Dental caries—Number of teeth affected.*

| | United States (continental) except Alaska. | | Philippine Islands. | | Total. | |
|---|---|---|---|---|---|---|
| | Number. | Ratios per 1,000 of mean strength. | Number. | Ratios per 1,000 of mean strength. | Number. | Ratios per 1,000 of mean strength. |
| White troops | 16,248 | 376.08 | 11,378 | 884.90 | 27,626 | 492.78 |
| Colored troops | 1,147 | 367.50 | ........ | ........ | 1,147 | 367.50 |
| Filipino troops | 20 | 73.53 | 136 | 31.71 | 156 | 34.20 |
| Total troops | 17,415 | 373.75 | 11,514 | 671.49 | 28,929 | 453.84 |

## HOSPITAL CORPS.

At the date of last report, June 30, 1904, the strength of the Hospital Corps was as follows:

| | |
|---|---|
| Sergeants, first class | 274 |
| Sergeants | 269 |
| Corporals | 19 |
| Privates, first class | 1,490 |
| Privates | 1,028 |

Since then it has gained:

| | |
|---|---|
| By enlistment | 1,029 |
| By transfer | 706 |
| Return from desertion | 38 |

And lost during the same period:

| | |
|---|---|
| By discharge by expiration of term of service | 1,364 |
| By discharge by order | 96 |
| By discharge by sentence of general court-martial | 46 |
| By discharge on surgeon's certificate of disability | 48 |
| By transfer to the line | 9 |
| By retirement | 8 |
| By death due to disease | 16 |
| By death due to suicide | 1 |
| By death due to drowning | 4 |
| By desertion | 198 |
| Killed in action | 3 |

Leaving in service June 30, 1905:

| | |
|---|---|
| Sergeants, first class | 275 |
| Sergeants | 277 |
| Corporals | 16 |
| Privates, first class | 1,159 |
| Privates | 1,333 |

The 26 vacancies existing in the grade of sergeant, first class, June 30, 1904, and those occurring shortly thereafter, were filled on September 9 of that year by appointment of 35 sergeants who had received the highest marks in a competitive examination held in accordance with existing law and regulations.

The needs of the service as to this class of noncommissioned officers having been fully met it was not deemed advisable to hold a competitive examination during the year ended June 30, 1905. The chief surgeons of all the military departments in the United States and the Philippines were, however, notified in the early part of May that such an examination would be held during the coming September, and questions for that purpose were forwarded to the chief surgeon, Philippines Division, in the early part of June. There are now about 25 vacancies in the grade of sergeant, first class.

*Recruitment.*—The importance of this branch of the administration of the corps has received most careful consideration. The total number of losses from all causes during the past fiscal year were 1,793. Two hundred and fifty members of the corps reenlisted the day following discharge and 779 enlistments and reenlistments were made from civil life (a total gain of 1,029), leaving 764 vacancies to be made up from other sources. These were nearly all filled by transfer to the corps of enlisted men of the line. One of the reasons for this large transfer and the comparatively small number of enlistments is the remarkably favorable condition of the wage-earner who could always find plenty of remunerative work in civil life during the spring, summer, and early fall. Another reason is the great care exercised in the selection of civilian applicants for enlistment, who are required to come up to the regulation standard, except as to minor defects of vision which are entirely corrected by glasses.

During the period from January to December, 1906, the corps will lose about 600 men by expiration of service, and this number will probably be increased by discharges on surgeon's certificate of disability, by purchase, by sentence of general court-martial, and by casualties from death, desertion, etc.

The distribution of the Hospital Corps at date of this report according to latest returns is as follows:

| Department. | Sergeants, first class. | Sergeants. | Corporals. | Privates, first class. | Privates. | Total. |
|---|---|---|---|---|---|---|
| California | 13 | 12 | | 59 | 58 | 142 |
| Colorado | 8 | 7 | | 31 | 38 | 84 |
| Columbia | 12 | 12 | | 48 | 49 | 121 |
| Dakota | 7 | 6 | | 33 | 36 | 82 |
| East | 40 | 36 | | 166 | 211 | 453 |
| Gulf | 12 | 8 | | 44 | 50 | 114 |
| Lakes | 7 | 14 | | 31 | 32 | 84 |
| Missouri | 16 | 30 | 2 | 79 | 105 | 232 |
| Texas | 11 | 8 | | 46 | 39 | 104 |
| Independent | 51 | 58 | 10 | 261 | 323 | 703 |
| Total, United States | 177 | 191 | 12 | 798 | 941 | 2,119 |
| Alaska | 7 | 3 | | 24 | 20 | 54 |
| Porto Rico | | 2 | | 6 | 13 | 21 |
| Hawaii | 1 | 2 | | 3 | 6 | 12 |
| Philippine Islands | 80 | 71 | 4 | 307 | 349 | 811 |
| Ordered to Philippine Islands | 4 | 6 | | | | 10 |
| China | 1 | | | 5 | | 6 |
| Transports | 5 | 2 | | 16 | 4 | 27 |
| Grand total | 275 | 277 | 16 | 1,159 | 1,333 | 3,060 |

That the esprit of the corps has been materially raised during the last few years is fully shown by the reports of inspectors-general and the commendations of the various officers of this department as well as of the line, concerning the conduct of the men during active operations in the field and particularly while on the firing line.

During the year the following-named men were killed in action in the Philippines:

Private Morris Simon, killed by hostile Moros at Buglebung, island of Basilan, Mindanao, March 17, 1905.

Private First Class Robert W. Toler, killed September 6, 1904, during engagement with armed Pulajans at Hemegangan.

Private Willie Johnson, killed November 10, 1904.

Private Guy R. Austin was severely wounded January 8, 1905, at Malog, Samar, Philippine Islands.

Sergt. George W. Hall, Private First Class Charles D. Mann, and Private J. M. Shreve, Hospital Corps, were commended for their services in action on January 7, 1905, at the taking of Usap's Cotta on the island of Jolo, Philippine Islands.

Privates Edward J. Brown, Robert E. Pastors, Frank Pease, and Patrick Fahey, Hospital Corps, were commended for their devotion to duty in general orders from the headquarters, Department of Mindanao, January 1, 1905, and General Orders, No. 2, Philippines Division, January 12, 1905, respectively.

Sergeant First Class Leopold David was highly commended for his services to Indians in Alaska during the months of February, March, and April, 1905.

The following changes in administration materially affecting the Hospital Corps have occurred during the past fiscal year:

The Military Secretary on September 29, 1904, informed me of the approval by the Secretary of War for a change of designation of companies of instruction Nos. 1 and 2, Hospital Corps, to companies of instruction A and B.

Company B changed station August 30, 1904, from Fort McDowell, Cal., to the Presidio of San Francisco, Cal. The scheme of instruction has been slightly altered to meet, as far as seems desirable, the views of the commanding officer of Company B.

The average number of men under instruction during the calendar year was in Company A 163, in Company B 145. In Company A the number of men who completed the course and were assigned to duty elsewhere was 138, in Company B 178.

About a thousand recruits are required annually for the Hospital Corps, and each company is capable of receiving and instructing about 300 men, so that if all recruits are to pass through the companies, as seems desirable, it will be necessary to establish at least one more such company. It has therefore been recommended that a third company should be established and, in order that it may be centrally located, Fort D. A. Russell, Wyo., has been selected for its station.

The revised Drill Regulations and Outlines of First Aid for the Hospital Corps, prepared by the board of medical officers convened by Special Orders, No. 104, War Department, May 4, 1903, were approved by the Secretary of War in October of 1904, and distributed to the Army in February, 1905.

In order that those members of the Hospital Corps who are serving with cavalry troops should receive the proper instruction in equitation a regulation was issued by the Secretary of War, June 10, 1905, requiring these men to be reported to a troop commander one day of each week, to be determined by the post commander, for one hour of instruction with the members of the troop.

### NURSE CORPS (FEMALE).

During the year there have been 326 applications for admission to the Army Nurse Corps. Thirty-five discharges have allowed the same number of appointments, five of which were from among those who had given previous acceptable service. There are now 7 hospitals where trained women are employed—2 in this country and 5 in the Philippine Islands. The close of the fiscal year finds the corps at its full strength, distributed as follows:

| | |
|---|---|
| United States Army General Hospital, Presidio of San Francisco, Cal | 46 |
| United States Army General Hospital, Fort Bayard, N. Mex | 16 |
| Division Hospital, Manila, P. I | 22 |
| Convalescent Hospital, Corregidor Island, P. I | 2 |
| Base Hospital, Iloilo, P. I | 3 |
| Zamboanga, Mindanao, P. I | 6 |
| Camp Keithley, Mindanao, P. I | 4 |
| Home awaiting discharge | 1 |

There has been no death among the nurses on active duty since 1899, and only 3 cases of critical illness—2 of acute nephritis, 1 of pneumonia; none in the past year. After seven years it would seem that the employment of trained women in army hospitals had passed the experimental stage. Steps should be taken to offer inducements to the most highly efficient to remain in the corps and to make the service attractive to the best class of graduate nurses outside. In the report of the inspector-general, Pacific Division, to the Secretary of War, April 7 to 11, 1905, is found unqualified commendation of the nurses, accompanied by recommendations identical with those made in the report from this office for the last fiscal year:

> The Army Nurse Corps is most efficient and attentive to its duties. The conduct of the nurses has been unexceptionable, and the work deserves the warmest praise.

It would therefore seem reasonable and particularly appropriate to encourage them by: (1) An increase of pay—10 per cent for every five years (or 5 per cent for every three years); (2) commutation of rations in lieu of the ration itself; (3) cumulative leave for such period as may seem advisable to the department.

## MANEUVERS.

Combined maneuvers of the Regular Army and the Militia were held during the year at American Lake, Washington, from July 7 to 19; at Camp Atascadero, Cal., August 13 to 25 and at Manassas, Va., September 5 to 10, 1904.

At each of these camps no effort was spared to make the sanitary conditions as perfect as possible, and that these efforts were successful is shown by the very small sick list. The opportunity to give medical officers and hospital corps a chance to practically apply field service regulations was used to the fullest extent and was productive of good results.

The reports received from the various chief surgeons have been carefully studied and the following observations embrace the more important points covered by them:

1. *Camp sanitation.*—Water supply: This was generally satisfactory, but there was a general consensus of opinion that water carts in sufficient number should be supplied to troops in the field.

There is practical agreement that the privy-pit system, no matter how carefully looked after, should have no place in a camp of a week's duration or longer, and that it should be replaced by the disinfecting trough system or by crematories as soon as a practical type of the latter is available.

Disposal of garbage: The pit system is equally condemned for this purpose, and should be replaced by covered cans removed daily, or by cremation.

2. *Instruction in removal of wounded.*—The method of imparting this special instruction gave unsatisfactory results. The men who were given diagnosis tags and directed to fall out as wounded during engagements generally failed to do so, or if they did fall out failed to wait to be cared for by the medical department, but took the shortest route back to camp or to their organizations. The umpires apparently gave no particular attention to this feature of the problems.

It is recommended that special days be set apart for the instruction of the command in this important subject, with medical officers as umpires to criticise the arrangements made and the method of carrying them out. On such occasions companies or battalions of the line should be detailed to assist in removing the wounded, on the theory that the day is advanced, and owing to the large number of wounded it will be impossible for the medical organization alone to clear the field in time. Part of this work should be done at night. Such a scheme would impress upon the line how important this feature of battle may become.

3. *Personnel of the Medical Department.*—It was generally noted that there was a deficiency in numbers of both medical officers and Hospital Corps to properly man the various field organizations of the medical department, and that in order to obtain the best results in practice these organizations should have their full quota of personnel and material.

All the officers and men that could be spared from posts were sent to these camps, but it will be impossible to furnish complete quota until the corps is enlarged as proposed.

*4. Material of the Medical Department.*—Lack of sufficient mounts for the Hospital Corps and lack of adequate transportation was reported from every camp. Until the Medical Department can control its own transportation it will always be liable at any moment to a breakdown in this vital matter.

The ambulances issued were of several different patterns, none answering all requirements. Two animals were generally furnished for each ambulance, whereas four are necessary in the field. Several officers recommended motor ambulances.

The travois which were tried were also of several patterns and some did not fit the present litter. The travois principle was, however, generally recommended.

Recommendations were also made that wheel litters be given a trial at maneuvers.

It is evident that the whole question of vehicles for the removal of wounded requires careful revision and consideration, and it is recommended that a board of officers of the Medical and Quartermaster Departments be appointed to consider the subject.

## ARMY AND NAVY GENERAL HOSPITAL, HOT SPRINGS, ARK.

During the last calendar year 565 patients were treated in this hospital, of which 35 were officers of the Army and 13 were officers of the Navy. The admissions were classified as follows: Rheumatism in various forms, 267; diseases of the digestive system, 39; of the nervous system, 65; of the kidneys, 13; malarial fevers, cachexia, etc., 27; other diseases, 154. Of the total number of patients treated, 325 were returned to duty or returned to their homes; 44 were discharged for disability; 2 died; 97 were otherwise disposed of, and 97 remained under treatment December 31, 1904.

Lieut. Col. Blair D. Taylor, deputy surgeon-general, U. S. Army, commanding officer of the hospital, is of the opinion that chronic diarrhea and catarrhal affections of the digestive and respiratory tracts, especially lung troubles, are rather aggravated than benefited by the course of treatment received at this institution, and recommends that such cases be eliminated from those which may properly be expected to improve under treatment in the general hospital. All patients with organic lesions of the heart should be barred, as the baths are injurious and may be fatal.

The following rules for bathing are in force in the hospital:

1. *The ordinary tub bath.*—Disrobe in dressing room, temperature 80° F.; enter bathroom, temperature 102° to 105° F.; drink glass of hot water; lie 10 minutes in tub of water, temperature 98° F.; rub thoroughly until dry; return to dressing room and lie covered with light blanket for about 20 minutes. Effect is sedative or very mildly exciting. Indicated in all subacute and chronic disorders except wasting diseases, as tuberculosis, cancer, advanced Bright's disease, diabetes mellitus, weak heart and organic lesions; in skin diseases of squamous varieties, neurosis, subacute and chronic, ptyalism from mercury, aiding elimination of potassium salts while in action, incipient or subacute nephritis. Contraindicated in advanced locomotor ataxia and amebic dysentery.

2. *The tub sweat bath.*—Disrobe in dressing room, as above; lie in tub of water at 98° to 102° F. for 8 to 12 minutes; drink hot water freely; repair to vapor cabinet for 1 to 3 minutes; rub well for the second time, and wrap in blanket pack for 10 to 12 minutes in bathroom. The patient is then put under a shower at the temperature of his bath, dried, and allowed to lie in dressing room under blanket for 20 minutes. Effect is exciting and powerful in its action on the skin. Indicated in neurosis, acute, subacute, and chronic; eliminations of toxins and drugs, nicotinism and septic infections; syphilis. Contraindicated in same cases as the ordinary bath.

3. *The tonic tub bath.*—Disrobe as before in dressing room; enter a tub of water at 90° F., which is quickly raised to 98° to 100° F.; remain 8 to 10 minutes; drink freely of hot water. The patient then takes the vapor for 1 to 2 minutes, and after brisk rubbing stops under the circular and rain douche at 90° F. for only 6 seconds; rub dry and dress. Effect, tonic and stimulating. Indicated in neurasthenia, anemia, neuritis, malnutrition, and functional gastrointestinal disorders.

*Massage or douche baths.*—Any of the various forms of these baths may be directed by the medical officer in connection with any of the tub baths mentioned above.

(1) The circular needle douche, at varying temperatures and times, indicated in neuritis, neurasthenia, anemia, cardiac complications.

(2) Rain or shower douche, at varying temperatures and times. Generally combined with the needle douche, and useful in same class of cases.

(3) The Scotch douche: This consists in alternating jets of hot and cold water at varying temperatures and pressures. Indicated in sciatica and applied above the seat of pain; tabes dorsalis combined with coordinating movements.

(4) The Charcot douche: This is a jet douche, applied to the spine, of either hot or cold water, either intermittent or continued, and at varying temperatures and pressures. Indicated in tabes dorsalis, multiple neuritis, neurasthenia, and neuralgia of spinal origin.

(5) The perineal or prostatic douche varies in temperatures and pressure. Indicated in prostatic irritation and enlargements, spermatorrhea and chronic constipation.

(6) The liver and lumbar comb douche: Varying temperatures. Indicated in lumbago, renal disorders, and hepatic diseases, subacute and chronic.

(7) The sitz bath may be mentioned under this head, varying in temperatures and time. Indicated in chronic constipation, vesical and prostatic disorders.

The neighboring waters of value are: The potash sulphur, Mountain Valley, Allen's alterative water, and magnesia water. The first is useful in skin diseases and syphilis, and the Mountain Valley water is an excellent diuretic in kidney diseases. The two latter are eliminative through the skin and bowels.

The temperature of bathrooms should be 102° F. for the minimum, and not to exceed 106° F. for the maximum. The dressing or cooling room should be kept at from 80° to 82° F. Baths should not be taken ordinarily until 1½ hours after eating a full meal. If circumstances require the bath to be taken sooner, the meal should be very light. The enlisted men in this hospital commence bathing 2½ hours after breakfast. Baths should be discontinued upon any rise of temperature or recurrence of acute symptoms of the disease and only resumed when the subacute or chronic stage recurs. A bath should be omitted when a previous one has made the patient weak, relaxed, and faint, or when heart's action becomes especially weak. Upon admission patients are, as a rule, only allowed to bathe every other day until they become acclimated, so to speak.

Massage is indicated in all chronic cases of rheumatic affections, whether arthritic or muscular; in stiffness of the joints from whatever cause; in sciatica, general neurasthenia, enlargement of the liver and spleen without too much tenderness, and chronic constipation. Massage is also useful in subacute conditions of the same nature as above when the soreness will admit of it. This therapeutic agent should never be used in acute conditions.

Care must be taken to wash the kidneys out thoroughly before stimulating the skin too much, otherwise the urine being concentrated, the débris is not sufficiently dissolved and the kidneys become clogged, and the skin, by assuming too long the functions of the kidneys, leaves them helpless to resume work when it is absolutely needed. Therefore there should be a proper balance struck between the excretions of the organs mentioned. This can best be done by drinking freely of the thermal water, and this procedure is one of the most valuable forms of treatment. To be effective the water should be as hot as it can be borne and directly from the conduit. The urine is, therefore, frequently examined and the amount of solids estimated.

## UNITED STATES ARMY GENERAL HOSPITAL, FORT BAYARD, N. MEX.

The buildings mentioned in the last annual report as under construction have been completed and are now in use. In addition to these a new set of quarters for ambulant patients is now nearly completed. The design of this building is to facilitate sleeping out of doors by affording protection from the wind. It is constructed after the old Spanish idea of an open court or patio, which is surrounded on all sides by narrow rooms intended for dressing rooms and in inclement weather for sleeping rooms. Patients will be required to sleep in the court in clear weather at all seasons of the year. It is expected that this building will be found an improvement over the tents which are now largely employed, as more perfectly excluding the winds while at the same time affording perfect ventilation.

Thirty-six hospital tents, accommodating 144 men, are now in use. These tents are floored and framed and are pitched in series of three. The flaps are thrown back so that three tents form virtually a single apartment in which 12 men are quartered. A small stove is placed in the center of each series for use during the colder weather, night and morning, while the patients are changing their clothes. Except at the hours for rising and retiring and during stormy weather, the sides of the tents are kept up. This affords the great advantage that the patients are able to rest in comfort even in cold weather while practically out of doors. It may be said that the use of tents, which was something of an experiment at first, has approved itself in practice throughout the year.

The extreme drought which was experienced in this region during the spring and summer of 1904 diminished the water supply of this hospital to such an extent as to produce great inconvenience. It became necessary to restrict the taking of baths and to use water for all purposes with great economy. Irrigation was entirely abandoned, and in consequence the dust storms which prevailed during the drought caused the patients much harm.

During the winter the unusual flow in the streams furnished an abundant supply of water and no scarcity is apprehended in the immediate future. It is hoped measures will be ultimately adopted which will result in the utilization of the entire subterranean flow in the valley of Cameron Creek. There is, however, little reason to doubt that even then the water supply will be inadequate for the needs of the institution and that it will be necessary to seek additional supplies of water elsewhere.

The number of cases treated during the year 1904 was 634, exclusive of minor cases of illness in men on duty. Of these 625 were cases of pulmonary tuberculosis. The cases of pulmonary tuberculosis are divided into four classes, as follows: (1) Afebrile cases without tubercle bacilli in the sputum; (2) approximately afebrile cases with tubercle bacilli in the sputum; (3) febrile cases in which the sputum contains tubercle bacilli; (4) febrile cases in which the sputum does not contain tubercle bacilli. The number in each class, with the results, are contained in the following table:

| Class. | Number of cases. | Disease arrested. | | Improved. | | Unimproved. | | Died. | |
|---|---|---|---|---|---|---|---|---|---|
| | | *No.* | *Per cent.* | *No.* | *Per cent.* | *No.* | *Per cent.* | *No.* | *Per cent.* |
| Class 1 | 93 | 5 | 5.38 | 82 | 88.17 | 5 | 5.38 | 1 | 1.07 |
| Class 2 | 239 | 5 | 2.10 | 181 | 75.72 | 46 | 19.20 | 7 | 2.93 |
| Class 3 | 283 | 1 | .35 | 112 | 39.58 | 117 | 41.34 | 53 | 18.73 |
| Class 4 | 10 | 1 | 10.00 | 4 | 40.00 | 5 | 50.00 | ...... | ......... |
| Total | 625 | 12 | 1.92 | 379 | 60.64 | 173 | 27.68 | 61 | 9.76 |

The term "disease arrested" is used in its strictest sense to denote the absence of all signs and symptoms of activity of the tuberculous process. In the case of a soldier it denotes that he is fit for duty. In most cases a patient has not been pronounced cured until he has been examined by a board of three medical officers, which is appointed to pass upon cases recommended for duty by the attending medical officer. In all but the most advanced cases improvement generally becomes apparent in weight and strength, in diminution of cough and expectoration, etc., after a stay of a few months. Such gains, however, do not always prove to be lasting, and cases are therefore not classed as "improved" in the above table unless physical examination shows a decrease in size of the pulmonary lesions as recorded upon admission, together with an improvement in the general condition.

Except in a few cases, which were considered capable of soon returning to duty, patients were formerly discharged from the Army after a stay of about two months at this hospital. They were immediately admitted as beneficiaries of the Soldiers' Home, so that their treatment could be continuous. As a matter of fact, however, all discharged soldiers who were able to travel, with a few exceptions, left the hospital and remained absent for several months or in many cases until it was evident that their health was becoming more impaired. In order to retain a hold upon the patients and to permit of continuous treatment for a longer period the average enlisted patient is now retained in the service about six months before he is discharged for disability. While the total number of cases treated during the year 1903 was 644 and in 1904 625, yet the cases remaining at the end of the year 1904 numbered 335 and those in 1903 but 257. It is evident, therefore, that the effect of this policy is to increase considerably the average number of patients. There can be no doubt of the advantages of early and continuous treatment, and it is hoped that patients may in time be educated to continue treatment at this hospital without intermission until they are entirely cured.

Formerly the regulations of the Soldiers' Home permitted its beneficiaries to go and come at will, but in 1904 the Board of Commissioners issued an order requiring inmates of the Home who take their discharge to remain absent for at least three months. This rule was adopted here July 2, 1904, with marked advantages as respects the continuity of treatment.

Of the cases treated in 1904 120 were not under continuous treatment, or, in other words, were beneficiaries of the Soldiers' Home who had taken their discharge and been subsequently readmitted. The average time lost from treatment in these cases was seven months and fourteen days. Of these 120, 14 died during the year 1904.

The following table shows the duration of treatment in 61 fatal cases of pulmonary tuberculosis in 1904:

| | Weeks. | | | | Months. | | Years. | | | Total. |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1. | 2. | 3. | 4. | 2 to 6. | 7 to 12. | 2. | 3. | 4. | |
| Time of death in 47 cases under continuous treatment | 1 | 6 | 1 | 3 | 22 | 9 | 4 | 1 | ... | 47 |
| Time of death in 14 cases not under continuous treatment: | | | | | | | | | | |
| A. Reckoned from last admission | 3 | ... | 1 | ... | 5 | 4 | 1 | ... | ... | 14 |
| B. Reckoned from original admission in same cases | ... | ... | ... | ... | ........ | 1 | 4 | 5 | 4 | (14) |

Inspection of this table shows the effect upon death rate of the readmission of discharged patients. It will be observed that more than two-thirds of the deaths occur within six months after admission or readmission and nearly all within the first year.

Experiments in the effects of X-ray in the treatment of pulmonary tuberculosis on a small scale were started July 8, 1904, with eight advanced cases. The patients were exposed for fifteen minutes three times a week, the exposures being made alternately on the chests and backs with the Static machine. These exposures were continued until September 18, 1904. A thorough examination was made of each case before and after treatment. It was impossible to detect that a single case had improved under the exposures. No bad effect was noticed other than a slight erythema of the chest and back in three cases, which rapidly disappeared after the exposures were stopped.

In comparison with other methods the diagnosis by X-rays of slight tuberculous affections of the lungs has not proven as satisfactory either by fluoroscopy or skiagraphy. In conjunction with other methods the X-rays are of undoubted value in the diagnosis of pulmonary tuberculosis.

## UNITED STATES ARMY GENERAL HOSPITAL, PRESIDIO OF SAN FRANCISCO, CAL.

The number of cases treated in this hospital during the year shows an increase of 133 admissions over 1903. Of these admissions, only 656 out of a total of 2,287 cases were from the Pacific Islands, less than half as many as for the corresponding period of last year; on the other hand, the admissions from the United States were nearly doubled. The discharges for disability were little more than half the number for last year; the number of deaths and insane were practically unchanged this year. Of the 46 deaths, 18 were due to pneumonia and 6 to tuberculosis of the lungs. The following is a numerical statement of the admissions and dispositions of sick during the calendar year 1904:

| | From islands. | From United States. | Total. |
|---|---|---|---|
| Remaining in hospital Dec. 31, 1903 | 160 | 111 | 271 |
| Total admissions during the period | 656 | 1,631 | 2,287 |
| For gunshot wounds | 9 | 14 | 23 |
| For diarrhea and dysentery | 208 | 96 | 304 |
| For malarial fevers | 25 | 47 | 72 |
| For typhoid fever | 4 | 8 | 12 |
| For rheumatic affections | 27 | 47 | 74 |
| For venereal diseases | 51 | 273 | 324 |
| For alcoholism | 1 | 15 | 16 |
| For injuries | 36 | 177 | 213 |
| For insanity | 35 | 19 | 54 |
| For all other causes | 260 | 935 | 1,195 |
| Total returned to duty | 267 | 1,007 | 1,274 |
| Total discharged for disability | 98 | 94 | 192 |
| Total discharged, expiration of service | 146 | 92 | 238 |
| Deaths from all causes | 14 | 32 | 46 |
| Desertions | 6 | 12 | 18 |
| Sent to Government Hospital for the Insane | 29 | 12 | 41 |
| Sent to general hospital, Fort Bayard, N. Mex | 55 | 14 | 69 |
| Sent to general hospital, Hot Springs, Ark | 11 | 7 | 18 |
| Sent to Alcatraz Island, California | 1 | 0 | 1 |
| Otherwise disposed of | 115 | 216 | 331 |
| Remaining in hospital Dec. 31, 1904 | 131 | 199 | 330 |

Daily average, 257.1.

Many important operations were done at this hospital, and the usual excellent results obtained. An interesting incident is the increasing frequency with which chloroform is being used as a general anesthetic in this institution. In 226 cases of general anesthesia the agents employed were as follows: Chloroform, 208; ether, 9; chloroform and ether, 9.

Assistant Surgeon Craig, the pathologist of the hospital, again calls attention to the steadily decreasing frequency with which malarial parasites are found in the blood of patients; this year there were 2,085 examinations, of which only 33 were positive; this is largely due to the diminishing frequency of malarial fevers among the soldiers in the Philippines. He also invites attention to the large proportion of patients from the Philippine Islands who show albumin and casts in the urine, these conditions disappearing usually after the patient has been in the hospital a few weeks.

## UNITED STATES ARMY GENERAL HOSPITAL, WASHINGTON BARRACKS, WASHINGTON, D. C.

In 1898 the post hospital at Washington Barracks was changed by order of the Secretary of War to a general hospital, and later Company A of the Hospital Corps was attached to it. The usefulness of this hospital, under direct control of the Surgeon-General, for the treatment of special cases, for the examination and treatment of officers temporarily or permanently incapacitated, for training hospital-corps recruits in nursing, and for instruction in connection with the Army Medical School soon became so apparent that it was desired to make the institution permanent, particularly, also, as such permanent establishment would make a nucleus capable of quick expansion into a base hospital in time of war.

To meet all requirements it was necessary that a new and adequate hospital be erected on a suitable site. As stated in my previous reports, with the approval of the Secretary of War, this matter was first laid before Congress in 1902. It is a matter for congratulation that favorable action was secured last session, when $100,000 was appropriated for the purchase of a site and contracts up to $200,000 additional were authorized for building.

A site of 43½ acres on high ground, not far from the Soldiers' Home, with street-car and other facilities, has been recommended, and its purchase has been approved by the Secretary of War. On this site an adequate permanent building will be erected.

It is hoped that in time Congress will see the advisability of placing on these grounds a suitable academic building for the Army Medical School, a barrack for a company of Hospital Corps, officers' quarters and other buildings, and possibly also, with the city's expansion, a new building for the Library and Museum, Surgeon-General's Office, so making a complete medico-military establishment for medical and educational purposes which would be of inestimable value to the Medical Department and through it to the Army as a whole.

### CARE OF DESTITUTE PATIENTS IN THE PROVIDENCE HOSPITAL, WASHINGTON, D. C.

The act approved March 28, 1904, having appropriated $19,000 for the support and medical treatment of destitute patients in the city of Washington, D. C., under a contract to be made with Providence Hospital by the Surgeon-General of the Army, the relief afforded was as follows:

| | |
|---|---|
| Patients in hospital July 1, 1904 | 98 |
| Admitted during the year | 1,164 |
| Total number treated | 1,262 |
| Average number admitted per month | 105 |
| Number remaining in hospital June 30, 1905 | 91 |
| Total number of days' treatment afforded | 37,246 |
| Average number of days' treatment per patient | 30 |
| Average number of patients treated per day | 102 |
| Longest term of treatment (days) | 365 |
| Shortest term of treatment (day) | 1 |
| Number of patients in hospital during the whole year | 2 |

### HOSPITAL CONSTRUCTION AND REPAIR.

During the last fiscal year new modern hospitals were contracted for at Fort Caswell, N. C.; Fort Mott, N. J.; Fort Riley, Kans.; Fort Screven, Ga., and Fort Totten, N. Y.

Contracts were also entered into for enlarging the hospitals at Fort Ethan Allen, Vt.; Fort Leavenworth, Kans.; Fort Sheridan, Ill.; Fort Slocum, N. Y.; Fort Snelling, Minn.; and Fort Wadsworth; N. Y.

Funds were furnished to purchase material for the erection of a new hospital at Fort Egbert, Alaska; and a central dispensary for use in connection with the hospital at Fort Moultrie, S. C., was contracted for. A solarium has been added to the hospital at Fort Myer, Va., and the hospital at Fort Monroe, Va., has been further improved.

Plans and specifications were prepared for the above hospitals and improvements, also for new hospitals at Fort Andrews, Mass.; Indianapolis, Ind.; Fort Levett, Me.; Camp William McKinley, Honolulu; Fort Michie, N. Y.; Fort Mackenzie, Wyo.; Fort Omaha, Nebr.; Point Bonita, Cal.; Fort Stark, N. H.; Fort Wetherill, R. I.; Fort Wood, N. Y., and for an additional story for the hospital at Fort Casey, Wash. Some of these hospitals are now under contract, some are on the market for proposals, while others are being erected by the Quartermaster's Department.

Funds have been provided for hospital improvements in the Philippine Islands; to enlarge and improve the hospital at Fort Assinniboine, Mont.; to enlarge and improve the United States army general hospital at Fort Bayard, N. Mex., including the fitting up of a gymnasium and amusement hall; to enlarge and improve the United States army general hospital at the Presidio of San Francisco, Cal., including the addition of a second story to the administration building; to cover all repairs and improvements needed for the Army and Navy General Hospital, Hot Springs, Ark., and for such repairs as were actually necessary at Washington Barracks, D. C.

In addition to the above, all hospitals at military posts have been kept in repair, operating rooms in some instances have been modernized and such improvements made as the limited amount of funds would permit.

Owing to the limitation fixed by section 1136 of the Revised Statutes, it is not possible to erect modern hospitals at various posts. This statute was enacted March 3, 1859, when conditions were vastly different. To meet present demands it is not practicable to erect a modern and sanitary hospital for 12 patients, thoroughly equipped, for $20,000. At the most accessible posts proposals have to be invited several times, and essential portions of the buildings have to be omitted before contracts can be made. This method causes delay, and not only involves the cost of changing the plans and specifications and readvertising, but requires an additional outlay for installing omitted portions at a greater expense, which procedure is neither economical nor advantageous to the Government. It is recommended that section 1136 of the Revised Statutes be amended to read, "fifty thousand dollars," instead of "twenty thousand dollars," in order to overcome the increased cost of material and labor since the enactment of the law in 1859.

It may be possible to erect a small hospital for 12 beds in one locality for $25,000, while in another section of the country a similar building would cost over $30,000, the advance being due to the isolated situation entailing an extra cost for transportation, and lack of competition. These small hospitals, in addition to a ward of 12 beds, furnish quarters for 8 attendants and are provided with an office, dispensary, mess room, kitchen, laboratory, operating room, instrument room, isolation ward, officers' ward, ward masters' room, room for patients' effects, linen room, a dark room for the examination of the eyes, etc., lavatories, storerooms, boiler room, and fuel room, all of which are necessary. The cost of erecting larger hospitals is less in proportion to size.

New quarters for sergeants, first class, Hospital Corps, have been contracted for at Fort Mason, Cal., and Fort Totten, N. Y. The quarters at various posts have been improved and minor repairs made where absolutely necessary. Owing to the increased cost of material and labor it is not possible to meet all requirements from the appropriations authorized and larger amounts should be provided to meet the growing demands.

## MEDICAL AND HOSPITAL SUPPLIES.

The amount estimated for by this office for medical and hospital appropriation for the fiscal year ending June 30, 1905, was $650,000. This was reduced by the War Department to $550,000, which was appropriated by Congress. This amount was not sufficient to properly meet all the wants of the Medical Department, which in the matter of supplies has had to be administered somewhat parsimoniously. It has also been impossible to replace the field equipment issued to the organized militia of States, transfer of funds for which was as a rule made too late in the year to be available.

Field medical equipment has been issued to the organized militia of States under the act approved March 2, 1903, and section 1661 Revised Statutes, as follows:

| | |
|---|---|
| Alabama | $96.05 |
| Connecticut | 1,549.55 |
| Florida | 386.84 |
| Georgia | 1,411.74 |
| Illinois | 1,683.60 |
| Indiana | 186.83 |
| Louisiana | 367.57 |
| Maine | 247.84 |
| Maryland | 61.00 |
| Massachusetts | 160.99 |
| Michigan | 221.14 |
| Mississippi | 1,522.72 |
| Missouri | 542.26 |
| Nebraska | 744.33 |
| New Jersey | 1,416.87 |
| New Mexico | 55.66 |
| New York | $4,586.76 |
| North Dakota | 89.23 |
| Ohio | 1,705.90 |
| Oregon | 1,146.69 |
| Pennsylvania | 2,686.61 |
| Tennessee | 672.36 |
| Texas | 12.00 |
| Utah | 27.83 |
| Vermont | 746.58 |
| Virginia | 342.66 |
| West Virginia | 119.50 |
| | 22,791.11 |
| Issued to Navy Department | 250.14 |
| Total | 23,041.25 |

There having been difficulty in securing promptly medical and hospital supplies for the sanitary service of the Isthmian Canal Commission, a request was made by that Commission that the Secretary of War authorize the Medical Department of the Army to act as their purchasing agent for such supplies, which request was approved April 28, 1905. The Medical Department was at the same time authorized to issue supplies from stock on hand for use in the Canal Zone, the value of which is transferred to the medical and hospital account on the books of the Treasury Department. This system has worked satisfactorily. A very large amount of medical and hospital supplies has been purchased and promptly forwarded to the Isthmus, in addition to issues from stock on hand to the amount of over $10,000. This work has been done by the regular personnel of the Medical Department without other assistance than an additional clerk, whose salary is paid by the Commission and who is employed in the preparation of their vouchers.

The field medical supply depot, which was located in the basement of the Army Medical Museum building, having become too small for the needs of the service, has been moved to a building rented for the purpose, 1229 Twentieth street N. W., Washington, D.C. Although the fireproof portion of this building, amounting to about one-third of it, has been retained by the Quartermaster's Department for other purposes, the amount turned over to the Medical Department is sufficient for present needs and admits of the assembling of additional field hospitals at this depot. Accordingly, on May 10, 1905, instructions were issued for the assembling, in addition to the five mentioned in the preceding report, of the following field hospitals, complete in every respect with ordnance, tentage, and other quartermaster's equipment, except transportation.

Nos. 6, 7, 8, 9, 10, and 11 at the field medical supply depot, Washington, D. C.

Nos. 12, 13, and 14 at the medical supply depot, Manila, P. I.

Nos. 15, 16, and 17 at the medical field storehouse in connection with the medical supply depot, St. Louis, Mo.

The War Department has authorized the assembling of regimental hospitals at the following posts, in addition to the 19 enumerated in General Orders 75, War Department, December 31, 1903: Fort Assinniboine, Mont.; Fort Crook, Nebr.; Fort D. A. Russell, Wyo.; Fort Des Moines, Iowa; Madison Barracks, N. Y.; Fort Niobrara, Nebr.; Fort Oglethorpe, Ga.; Presidio of Monterey, Cal.; Fort Robinson, Nebr.; Fort Walla Walla, Wash.

The following are the medical supply depots:

| Location. | Officer in charge. | Number of posts and stations supplied. |
|---|---|---|
| New York City, N. Y., 391 Washington street. | Lieut. Col. H. S. Turrill, deputy surgeon-general, U. S. Army. | 72 |
| St. Louis, Mo., 204 South Eighth street (a) | Lieut. Col. L. W. Crampton, deputy surgeon-general, U. S. Army. | 37 |
| San Francisco, Cal., 655 Mission street. | Maj. Louis Brechemin, surgeon, U. S. Army ..... | 33 |
| Manila, P. I., Calle Concepcion ....... | Lieut. Col. D. M. Appel, deputy surgeon-general, U. S. Army. | 121 |
| Field Medical Supply Depot, 1229 Twentieth street N.W., Washington, D. C. | Capt. C. R. Darnall, assistant surgeon, U. S. Army. | (b) |

(a) This depot has on hand and issues field equipment.
(b) Field equipment for Army and organized militia.

The date of issue of annual supplies to the various posts has been changed in order to distribute evenly throughout the year the work at the depots. Instead of issuing all annual supplies on the 1st of January and 1st of July, as formerly, the issues are now made January 1, April 1, July 1, and October 1.

Experiments have been made during the year to develop a portable coil X-ray machine which could be conveniently transported in the field on an army wagon. A useful type has been adopted, which is actuated by its own motor with gasoline or petroleum fuel. It weighs, approximately, 1,200 pounds when packed. Six of these machines have been ordered from the manufacturers and will be issued to army posts.

## ARMY MEDICAL MUSEUM.

The total number of specimens in the Army Medical Museum at the end of the fiscal year June 30, 1905, was 35,054. The following statement shows in detail the additions and changes in the different sections:

| | | |
|---|---|---|
| Pathological section: | | |
| In museum June 30, 1904 | | 12,614 |
| Discarded | | 55 |
| | | 12,559 |
| Transferred from anatomical section | | 1 |
| Transferred from provisional pathological section | | 1 |
| Received during the year | | 98 |
| In museum June 30, 1905 | | 12,659 |
| Anatomical section: | | |
| In museum June 30, 1904 | | 1,168 |
| Discarded | 1 | |
| Transferred to pathological section | 1 | |
| | | 2 |
| | | 1,166 |
| Received during the year | | 4 |
| In museum June 30, 1905 | | 1,170 |
| Section of comparative anatomy: | | |
| In museum June 30, 1905 | | 1,410 |
| Microscopical section: | | |
| In museum June 30, 1905 | | 12,916 |
| Miscellaneous section: | | |
| In museum June 30, 1904 | | 2,831 |
| Discarded | 5 | |
| Transferred to U. S. National Museum | 7 | |
| | | 12 |
| | | 2,819 |
| Received during the year | | 115 |
| In museum June 30, 1905 | | 2,934 |
| Provisional pathological section: | | |
| In museum June 30, 1904 | | 1,201 |
| Discarded | 126 | |
| Donated to Georgetown University medical school | 2 | |
| Donated to students | 21 | |
| Transferred to pathological section | 1 | |
| | | 150 |
| In museum June 30, 1905 | | 1,051 |
| Provisional anatomical section: | | |
| In museum June 30, 1904 | | 396 |
| Discarded | 12 | |
| Donated to students | 6 | |
| | | 18 |
| In museum June 30, 1905 | | 378 |
| Photographic series: | | |
| In museum June 30, 1904 | | 2,531 |
| Received during the year | | 5 |
| In museum June 30, 1905 | | 2,536 |

### RECAPITULATION.

| | |
|---|---|
| Specimens in museum June 30, 1904 | 35,067 |
| Discarded, transferred, and donated | 235 |
| | 34,832 |
| Added during the year | 222 |
| Specimens in museum June 30, 1905 | 35,054 |

The following are some of the more interesting specimens received during the fiscal year ending June 30, 1905:

*Anatomical.*—Specimens 4059 and 4060: A specimen of the hagfish and one of the elephant fish; from the U. S. National Museum.

*Pathological.*—Specimens 13007 to 13016: Twelve Buchhold preparations showing various pathological conditions; purchased.

Malformations, specimen 12954: Pseudohermaphroditism in pig; purchased. Specimen 12968: Anencephalus in a human fetus of 6 months; contributed by Dr. W. J. Dillenbach, Washington, D. C. Specimen 12957: Hypertrophy and distension of urinary passages from valvular obstruction of urethra, with other anomalies, in a 7-months human fetus; contributed by Dr. J. J. Repetti, Washington, D. C. Specimen 12962: Overriding of toes in a human fetus, both parents of which had a similar malformation; contributed by Dr. Mary Parsons, Washington, D. C. Specimen 12963: Dicephalus; two heads and two vertebral columns in a salmon; contributed by Mr. H. O. Hall, Washington, D. C. Specimen 12952: Thoracopagus in a 5-months human fetus; contributed by Dr. E. C. C. Winter, Washington, D. C. Specimen 12965: Thoracopagus in a new-born lamb; two hearts in one pericardium; purchased. Specimen 12976: Dipygus parasiticus in a chicken; contributed by Dr. D. S. Lamb, Washington, D. C.

*Infectious diseases.*—Specimen 12950: Tuberculous jaw of a monkey that died of general tuberculosis; contributed by Dr. A. Hrdlicka, U. S. National Museum. Specimen 12999: Tuberculous ileum; case of general tuberculosis; contributed by Dr. G. N. Acker, Washington, D. C. Specimen 12961: Tuberculous testicle from a soldier; removed and contributed by First Lieut. C. N. Barney, assistant surgeon U. S. Army. Specimen 12939: Congenital syphilis of bones of 6-months human fetus; contributed by Dr. A. Hrdlicka, U. S. National Museum. Specimen 13000A: Congenital syphilis of bones with marked deformity in a girl 11 years old; contributed by Dr. G. N. Acker, Washington, D. C. Specimens 12982 to 12993: Twelve wax models showing diphtheria of the air passages and upper part of alimentary canal; purchased.

*Diseases and injuries of the bone.*—Specimen 12936: Primary amputation of foot and leg because of compound fracture accidentally received; in a retired army officer, age 67; recovery; operator and contributor, Maj. W. C. Borden, surgeon, U. S. Army. Skiographs of the fractured limb were also contributed by Major Borden. Specimens 13017 to 13021: Five specimens of bones from Indian mounds showing inflammation, hip joint disease and fracture with repair; contributed by C. B. Moore, Philadelphia, Pa. Specimen 12938: Fractured skull from the Custer battlefield; contributed by First Lieut. James Carroll, assistant surgeon, U. S. Army. Specimen 12940: Osteoporosis of skull of child; contributed by Dr. A. Hrdlicka, U. S. National Museum. Specimen 12980: Osteosarcomo of fibula; in a boy, 9 years old; removed and contributed by Dr. J. Ford Thompson, Washington, D. C.; recovery.

*Circulatory system.*—Specimens 12942 to 12945: Hypertrophy and dilatation of heart from valvular disease; in an old man who had also cystic disease of kidneys; contributed by Dr. D. S. Lamb, Washington, D. C. Specimen 12978: Aneurism of arch of aorta rupturing into left pleura; several vertebræ were eroded; in a soldier who suddenly fell dead; contributed by Capt. Geo. A. Skinner, assistant surgeon, U. S. Army. Specimen 13004: Large aneurism of arch of aorta in a man, age 32; contributed by Capt. W. P. Chamberlain, assistant surgeon, U. S. Army.

*Brain.*—Specimens 12998 to 13000: Porencephalus in a girl 11 years old, who had also congenital syphilis of bone, and died of general tuberculosis; the heart was much atrophied, weighing less than that of a normal infant at 18 months; contributed by Dr. G. N. Acker, Washington, D. C. Specimens 12946 to 12949: Fibroma of brain weighing 6 ounces, from a boy, age 14. The tumor had perforated the skull; removed during life, but the boy died soon after the operation; operator and contributor, Dr. D. P. Hickling, Washington, D. C.

*Respiratory system.*—Specimens 12973 and 12974: Primary adenocarcinoma of thyroid and secondary adenocarcinoma of lung; in a woman, age 50; contributed by Dr. T. C.

Smith, Washington, D. C. Specimen 12964: Cystic polypus removed from nose; operator and contributor, Dr. W. K. Butler, Washington, D. C. Specimen 12943: Chronic ulcerative laryngitis, not specific; in a man, age 27; death from obstruction by muco-pus; contributed by Dr. D. S. Lamb, Washington, D. C. Specimens 12958 and 12959: Crupous pneumonia and acute pericarditis; in a man, age 41, who worked "in a damp place;" contributed by Dr. D. S. Lamb, Washington, D. C. Specimen 12979: Calcareous pleurisy; contributed by Dr. J. E. Meisenhelder, Soldiers' Home, Washington, D. C.

*Digestive system.*—Specimen 12966: Fibroid tonsil; from a woman, age 35; operator and contributor, Dr. R. S. Lamb, Washington, D. C. Specimens 12969 to 12972: Primary cancer of liver, secondary cancer of lung; also tuberculous kidney; from a woman; heart extremely atrophied, weighing only 5 ounces; contributed by Dr. G. N. Acker, Washington, D. C. Specimen 12944: Solitary cyst of liver, not parasitic; in a man, age 62; contributed by Dr. D. S. Lamb, Washington, D. C. Specimen 13005: Invagination of ileum and colon in an infant; contributed by Dr. G. W. Wood, Washington, D. C. Specimen 12967: Shot perforation of small intestine; in a soldier; the stomach also was perforated and liver lacerated; death in a few hours; contributed by First Lieut. G. H. R. Gosman, assistant surgeon, U. S. Army. Specimen 13028: Hemorrhagic pancreatitis; contributed by Dr. W. M. L. Coplin, Philadelphia, Pa.; a beautiful preparation, mounted in gelatin in a Petri dish. Specimen 13002: Large accessory spleen, contributed by Dr. D. S. Lamb, Washington, D. C.

*Peritoneal and retroperitoneal tumors.*—Specimen 13006: Myoma of peritoneum; in a woman; removed; post-mortem; contributed by Dr. G. W. Wood, Washington, D. C. Specimen 12996: Large retroperitoneal fibro-lipoma; removed and contributed by Dr. Geo. Ben. Johnston, Richmond, Va. Specimen 12997: Retroperitoneal fibroma weighing 16½ pounds; from a women, age 50; removed and contributed by Dr. I. S. Stone, Washington, D. C.; recovery. Specimen 12960: Large retroperitoneal sarcoma; from a woman, age 41; removed; post-mortem; no secondary growths; contributed by Dr. D. P. Hickling, Washington, D. C.

*Urinary and genital system.*—Specimens 13025 and 13026: Cystitis and pyelitis; in a soldier who had tabes dorsalis; contributed by Maj. Wm. H. Arthur, surgeon, U. S. Army. Specimen 12951: Sarcoma of kidney; in a girl, 5 years old; removed and contributed by Dr. James Kerr, Washington, D. C.; recovery. Specimen 12956: Penis amputated because of gangrene following chancroid; in a soldier; removed by First Lieut. W. A. Powell, assistant surgeon, and contributed by Maj. F. R. Keefer, surgeon, U. S. Army.

*Gynecology.*—Specimen 12977: Hysterectomy for uterine fibroid; woman, age 27; recovery; operator and contributor, Dr. D. P. Hickling, Washington, D. C. Specimen 13027: Hysterectomy for uterine fibroid; contributed by Dr. J. W. Bovée, Washington, D. C. Specimen 13033: Extirpation of uterine fibroid; woman, age 23; operator and contributor, Dr. W. A. Warfield. Specimen 13022: Pus tubes and ovarian cyst; removed and contributed by Dr. J. W. Bovée, Washington, D. C.

*Skin.*—Specimen 12994: Congenital fibro-lipoma; in a girl, age 9 years; removed and contributed by Dr. J. Ford Thompson, Washington, D. C.

*Dentistry.*—Specimens 13029 to 13032: Teeth showing anomalous number and fusion of roots; contributed by Dr. J. H. London, Washington, D. C.

*Miscellaneous.*—Microscopes of the more recent patterns have been added, as follows: Specimen 2990, Bausch and Lomb; specimen 2927, Beck; specimen 3033, Greenough; specimen 3036, Van Heurck; specimen 2950, Leitz; specimen 2987, Nebelthau; specimen 2928, Seibert; specimens 2933, 2993, Spencer; specimen 3032, Watson, and specimen 3001, Zeiss.

Specimens 3040, 3041: Old dental scalers and automatic mallet; contributed by Dr. W. N. Cogan, D. D. S., Washington, D. C. Specimen 3035: Old set of trial glasses for eye work; contributed by Dr. W. M. Phelps, Washington, D. C. Specimen 3025: Poisoned arrow heads used by the Itos tribe, Luzon; contributed by Dr. H. J. Harris, contract surgeon, U. S. Army. Specimens 3027, 3028: Piorry and Laennec stethoscopes, contributed by Dr. D. S. Lamb, Washington, D. C.

Also the following photographs: Specimen 2594: Multiple fibromata of skin in a Javanese woman and specimen 2593, elephantiasis in two Samoans; contributed by J. E. Standley, Seattle, Wash. Specimen 2592: Multiple fibromata of skin in a Filipino; contributed by First Lieut. R. B. Miller, assistant surgeon, U. S. Army.

## LIBRARY OF THE SURGEON-GENERAL'S OFFICE.

The following table shows the additions made to the library during the fiscal year 1904–5:

| Description. | On hand June 30, 1904. | Added during fiscal year. | Total June 30, 1905. |
|---|---|---|---|
| | *Volumes.* | *Volumes.* | *Volumes.* |
| Medical journals | 46,023 | 1,290 | 47,313 |
| Medical transactions | 7,341 | 124 | 7,465 |
| Bound theses | 2,319 | | 2,319 |
| Bound pamphlets | 2,875 | | 2,875 |
| Other medical books | 93,309 | 2,011 | 95,320 |
| Total | 151,867 | 3,425 | 155,292 |
| Medical theses | 68,854 | 2,296 | 71,150 |
| Medical pamphlets | 193,540 | 7,161 | 200,701 |
| Total | 262,394 | 9,457 | 271,851 |

There were presented to the library during the year 570 books and 9,490 pamphlets and journals.

Volume X, second series, of the Index Catalogue, includes the letter M to "Mnikhovski," and forms a volume of 935 pages. It will be ready for distribution at the usual time. The appropriation for Volume XI, second series, having been made, the manuscript is in course of preparation for the printer.

An appropriation of $8,000 having been made at the last session of Congress for the construction of the additional bookshelves so badly needed, contracts have been made for these stacks similar to those now in use, and it is hoped that the work will be completed before the winter.

## ARTIFICIAL LIMBS AND APPARATUS.

Under the laws relating to artificial limbs, apparatus, or commutation therefor, orders on manufacturers were given during the fiscal year for 32 legs, 2 arms, and 2 feet, and commutation certificates were issued for 155 cases of amputated leg, 84 amputated arm, 9 amputated foot, and for 1,820 cases of the loss of use of a limb.

Under the act of June 17, 1870, and subsequent amendments thereto, 23,005 disabled soldiers and sailors have been furnished artificial limbs or apparatus, or have received commutation in money, as follows: Total number benefited to June 30, 1905, 23,005; died, 9,684; dropped from the rolls, 592; rejected after one or more payments, 552; remaining on rolls at the end of the fiscal year, 12,153.

It is estimated that the sum of $145,000 will be required to pay the claims coming due during the fiscal year ending June 30, 1907.

## APPLIANCES AND TRUSSES.

One hundred fifty-nine appliances were issued during the fiscal year and 771 trusses were furnished and fitted.

## CARD SYSTEM.

The card system for the register of patients and report of sick and wounded has been adopted, the change being in the direction of simplicity and efficiency and preventing the duplication of work in this office and at posts.

## CLASSIFICATION OF DISEASES.

Since last year it has been found necessary to still further modify the nomenclature of diseases to keep pace with the advances in our knowledge of etiology and pathology. Medical officers in recording the causes of admission to sick report will hereafter make use of the following list as far as practicable:

### I.—General Diseases.

#### (a) *Epidemic diseases.*

1. Typhoid fever.
2. Exanthematic typhus.
3. Relapsing fever.
   Malarial fevers.
      1. Nonmalignant infections.
4.          (a) Intermittent.
5.          (b) Remittent or continued.
      2. Malignant (estivoautumnal) infections.
6.          (a) Intermittent.
7.          (b) Remittent or continued.
8.          (c) Pernicious.
9.    3. Malarial cachexia.
10.   4. Hemoglobinuric fever.
11. Smallpox.
12. Measles.
13. Scarlet fever.
14. Whooping cough.
15. Diphtheria.
16. Influenza.
17. Miliary fever.
18. Asiatic cholera.
19. Cholera nostras.
   Dysentery.
20.   1. Amebic.
21.   2. Bacillary.
22.   3. Mixed infections and other dysenteries.
23. Bubonic plague.
24. Yellow fever.
25. Leprosy.
26. Erysipelas.
27. Cerebrospinal meningitis, epidemic.
28. Beriberi.
29. Dengue.
30. Mumps.
31. Rubella.
32. Varicella.
33. Vaccinia.
34. Kala-Azar (trypanosomiasis?).
35. Malta fever.
36. Acute infectious jaundice (Weil's disease).
37. Yaws (Frambesia).
38. Epidemic dropsy.
39. Other epidemic diseases.

#### (b) *Other general diseases.*

40. Purulent infection and septicemia.
41. Glanders and farcy.
42. Anthrax.
43. Rabies.
44. Actinomycosis.
45. Trichinosis.
46. Pellagra.
47. Tuberculosis of the larnyx.
48. Tuberculosis of the lungs.
49. Tuberculosis of the meninges.
50. Tuberculosis of the abdomen.
51. Tuberculosis of the bones and joints.
52. Tuberculosis of other organs.
53. General tuberculosis.
   Syphilis and results.
54. Syphilis, primary.
55. Syphilis, secondary.
56. Syphilis, tertiary.
57. Syphilis, hereditary.
   Chancroids and results.

### I.—General Diseases—Continued.

#### (b) *Other general diseases*—Continued.

58. Chancroids.
59. Chancroidal bubo.
   Gonorrhea and results.
60. Gonorrhea.
61. Gonorrheal epididymitis and orchitis.
62. Gonorrheal ophthalmia.
63. Gonorrheal rheumatism.
64. Gonorrheal stricture of the urethra.
65. Gonorrheal bubo.
66. Other results of gonorrhea.
67. Other venereal diseases.
68. Cancer and other malignant tumors of the buccal cavity.
69. Cancer and other malignant tumors of stomach, liver.
70. Cancer and other malignant tumors of the peritoneum, intestines, rectum.
71. Cancer and other malignant tumors of other organs and unspecified.
72. Other tumors.
73. Acute articular rheumatism.
74. Rheumatism, articular, subacute, and chronic.
75. Gout.
76. Scurvy.
77. Diabetes.
78. Exophthalmic goiter.
79. Addison's disease.
80. Leukemia.
81. Anemia.
82. Other general diseases.
83. Acute alcoholism.
84. Delirium tremens.
85. Chronic alcoholism.
86. Chronic lead poisoning.
87. Other chronic poisonings (occupational).
88. Drug habit.
89. Narcotic poisonings, chronic.
90. Other chronic poisonings.

### II.—Diseases of the Nervous System and of the Organs of Special Sense.

#### (a) *Of the nervous system.*

91. Encephalitis.
92. Meningitis, cerebral.
93. Meningitis, spinal.
94. Progressive locomotor ataxia.
95. Other diseases of the spinal cord.
96. Cerebral congestion and hemorrhage.
97. Cerebral thrombosis and embolism (softening of the brain).
98. Paralysis, without specified cause.
99. General paralysis.
100. Insanity.
101. Hypochondriasis.
102. Melancholia.
103. Nostalgia.
104. Epilepsy.
105. Tetanus.
106. Chorea.
107. Neuralgia.
108. Neuritis.
109. Neurasthenia.
110. Other diseases of the nervous system.

## II.—Diseases of the Nervous System and of the Organs of Special Sense—Continued.

### (b) *Of the eye and its adnexa.*

111. Chalazion.
112. Trachoma.
113. Other diseases of the lids.
114. Lachrymal apparatus, diseases of.
115. Conjunctivitis, acute.
116. Conjunctivitis, chronic.
117. Pterygium.
118. Keratitis.
119. Sclerotitis.
120. Choroid, diseases of.
121. Iritis (nonvenereal).
122. Retinitis.
123. Snow-blindness.
124. Asthenopia.
125. Cataract.
126. Glaucoma.
127. Amblyopia.
128. Amaurosis.
129. Night-blindness.
130. Errors of refraction.
131. Other diseases of the eye and its adnexa.

### (c) *Of the ear and its adnexa.*

132. Diseases of the external ear.
133. Diseases of the tympanum.
134. Diseases of the middle and internal ear.
134½. Diseases of the mastoid.
135. Deafness.
136. Other diseases of the ear and its adnexa.

## III.—Diseases of the Circulatory System.

137. Pericarditis.
138. Acute endocarditis.
139. Organic diseases of the heart.
140. Angina pectoris.
141. Aneurism.
142. Other diseases of the arteries.
143. Embolism and thrombosis (except cerebral).
144. Varicocele.
145. Varicose veins.
146. Hemorrhoids.
147. Phlebitis.
148. Other diseases of the veins.
149. Adenitis, nonvenereal.
150. Lymphangitis, nonvenereal.
151. Climatic bubo.
152. Other diseases of the lymphatic system.
153. Hemorrhages.
Filariasis.
154. 1. Lymphatic varix.
155. 2. Lymph scrotum.
156. 3. Chyluria.
157. 4. Chylocele.
158. 5. Lymphangitis and elephantoid fever.
159. 6. Elephantiasis.
160. Trypanosomiasis.
Distomiasis (Bilharzia disease).
161. 1. Endemic hematuria.
162. 2. Rectal Bilharziosis.
163. Other parasitic diseases of the circulatory system.
164. Functional disease of the heart.
165. Other diseases of the circulatory system.

## IV.—Diseases of the Respiratory System.

166. Coryza.
167. Chronic nasal catarrh.
168. Nasal polypus.
169. Myiasis of the nasal fossæ.
170. Other diseases of the nasal fossæ.
171. Diseases of the larynx. (Nontubercular).
172. Diseases of the thyroid body.
173. Acute bronchitis.
174. Chronic bronchitis.
175. Broncho-pneumonia.
176. Pneumonia.
177. Pleurisy.
178. Congestion of the lungs.
179. Gangrene of the lungs.
180. Asthma.
181. Pulmonary emphysema.
182. Endemic hemoptysis (Distomiasis).
183. Other diseases of the respiratory system, phthisis excepted.

## V.—Diseases of the Digestive System.

184. Diseases of the salivary glands and ducts.
185. Diseases of the teeth, gums, and alveoli.
186. Diseases of the mouth and tongue.
187. Tonsillitis.
188. Other diseases of the pharynx.
189. Diseases of the esophagus.
190. Ulcer of the stomach.
191. Dyspepsia.
192. Gastritis.
193. Other diseases of the stomach, except cancer.
194. Diarrhea, acute.
195. Diarrhea, chronic.
196. Enteritis.
197. Colic, intestinal.
198. Sprue.
Intestinal parasites.
199. 1. Tænia mediocanellata (or saginata).
200. 2. Tænia solium.
201. 3. Tænia nana.
202. 4. Bothriocephalus latus.
203. 5. Distomida.
204. 6. Ascaris lumbricoides.
205. 7. Oxyuris vermicularis.
206. 8. Ankylostoma duodenale.
207. 9. Uncinaria Americana.
208. 10. Trichocephalus dispar.
209. 11. Other intestinal parasites.
210. Inguinal hernia.
211. Other herniæ.
212. Intestinal obstruction.
213. Constipation.
214. Fistula in ano.
215. Other diseases of the intestines.
216. Acute yellow atrophy of the liver.
217. Hydatid tumors of the liver.
218. Cirrhosis of the liver.
219. Biliary calculi.
220. Congestion of the liver.
221. Acute hepatitis.
222. Hepatic abscess.
223. Jaundice, catarrhal.
224. Other diseases of the liver.
225. Diseases of the spleen.
226. Simple peritonitis.
227. Appendicitis and abscesses of iliac fossæ.
228. Other diseases of the digestive system, cancer and tuberculosis excepted.

## VI.—Diseases (nonvenereal) of the Genito-Urinary System.

229. Acute nephritis.
230. Chronic nephritis.
231. Pyelitis and pyelonephritis.
232. Other diseases of the kidneys.
233. Renal calculi.
234. Vesical calculi.
235. Cystitis.
236. Other diseases of the bladder.
237. Stricture of the urethra.
238. Other diseases of the urethra.
239. Prostatitis.
240. Prostatic hypertrophy.
241. Other diseases of the prostate.
242. Balanitis.
243. Paraphimosis.
244. Phimosis.
245. Hematocele.
246. Hydrocele.
247. Orchitis.
248. Other nonvenereal diseases of the genital organs.

## VIII.—Diseases of the Skin and Cellular Tissue.

249. Gangrene.
250. Carbuncle.
251. Furuncle.
252. Acute abscess, phlegmon.
253. Corn and warts.
254. Ingrowing nails.
255. Chilblain.
256. Tropical ulcer.
256½. Sloughing phagedena.
257. Ulcers, other.
258. Dermatitis from poisonous plants.

### VIII.—DISEASES OF THE SKIN AND CELLULAR TISSUE—Continued.

259. Prickly heat.
260. Erythemata.
261. Herpes.
262. Eczema and pemphigus.
263. Impetigo and acne.
264. Urticaria.
265. Scabies.
266. Dhobie itch.
267. Jiggers.
268. Pemphigus contagiosus.
269. Mycetoma.
270. Tinia imbricata.
271. Ground itch.
272. Filaria medinensis.
273. Other parasitic diseases.
274. Other diseases of the skin and cellular tissue.

### IX.—DISEASES OF ORGANS OF LOCOMOTION.

275. Osteomyelitis.
276. Caries and necrosis of bone, nontubercular.
277. Periostitis.
279. Other nontubercular diseases of the bones.
280. Arthritis.
281. Bunion.
282. Tendo-synovitis.
283. Synovitis.
284. Bursitis.
285. Other diseases of the joints, except tuberculosis and rheumatism.
286. Muscular rheumatism and myalgia.
287. Other diseases of the organs of locomotion.

### X.—MALFORMATIONS, ETC.

288. Congenital malformations and arrested development.

### XII.—OLD AGE.

289. Senile debility.

### XIV.—ILL-DEFINED DISEASES.

290. Sudden death.
291. Malingering.
292. Febricula, simple continued, and other undetermined fevers.
293. Debility following operation and disease.
294. Exhaustion from overexertion and exposure.
295. Under observation, undiagnosed, and unknown.

### XIII.—EXTERNAL CAUSES.

296. Fractures of the skull.
297. Fractures of the spinal column.
298. Other fractures, exclusive of gunshot.
299. Dislocations.
300. Sprains.
301. Strain, muscular.
302. Abrasions and blisters (mechanical).
303. Concussion of the brain.
304. Concussion of the spine.
305. Contusions.
306. Wounds, contused.
307. Wounds, incised.
308. Wounds, lacerated.
309. Wounds, punctured.
310. Wounds, gunshot.
311. Crushing.
312. Other traumatisms.
313. Secondary results of injuries.
314. Burns and scalds.
315. Burns by corrosive substances.
316. Sunstroke.
317. Heat exhaustion.
318. Frostbite.
319. General freezing.
320. Electric shock.
321. Drowning.
322. Inanition (starvation, exclusive of disease).
323. Absorption of deleterious gases.
324. Narcotic poisonings, acute.
325. Corrosive and irritant poisonings, acute.
Venomous bites, stings, and wounds.
326. 1. Snake bites.
327. 2. Other venomous bites.
328. Other acute poisonings.
329. Explosions.
330. Suffocation, exclusive of disease.
331. Foreign bodies, presence of.
332. Other external violence.

### SUBCLASSIFICATION (INCLUDED ABOVE).

Suicide by poison.
Suicide by asphyxia.
Suicide by hanging or strangulation.
Suicide by drowning.
Suicide by firearms.
Suicide by cutting instruments.
Suicide by jumping from high places.
Suicide by crushing.
Suicide by other means.
Homicide.
Judicial execution.
Self-maiming.
Killed in action.
Wounded in action.
Died of wounds in action.

## REMARKS AND SPECIAL RECOMMENDATIONS.

### RELATION OF THE MEDICAL DEPARTMENT TO HYGIENE AND SANITATION OF THE ARMY.

One of the most important duties of the Medical Department of the Army, and that which is placed first in the Army Regulations on the subject, is that of investigating the sanitary condition of the Army and making recommendations in reference thereto. This is done by means of monthly and special sanitary reports, which thereby become of great value in showing the actual sanitary condition of the Army and the important defects and the measures taken or recommended for their correction.

In the new Army Regulations, 1904, the following words are added to paragraph 1413:

> The Medical Department is charged with the duty * * * "of advising with reference to the location of permanent camps and posts, the adoption of systems of water supply and purification, and the disposal of wastes."

This sets forth more specifically the relation of the Medical Department to such matters and constitutes an important step in advance. Under this paragraph sanitary questions which are disposed of at a post, department headquarters, or the headquarters of the Army, should be so disposed of only after obtaining officially the advice of the post surgeon, the chief surgeon of the department, or the Surgeon-General, as the case may be.

With the extension of military occupation to tropical countries at long distances over sea, the relation of the Medical Department to all matters in which sanitary questions are of the first importance should be still more clearly defined and should be binding upon the higher authorities.

The location, construction, and arrangement of barracks and quarters for occupation in the Tropics involves many points of the greatest importance in the prevention of disease. The same applies to transportation for long distances by sea and rail.

The Army Regulations should state specifically that except in emergency no troops should be allowed to embark on ship or rail until the opinion of a medical officer has been obtained that the ship or cars are suitable from a sanitary point of view.

Great improvement continues to be made in the character of the quarters constructed for the use of the Army; nevertheless, when important construction, alteration, or repairs are contemplated, the regulations should require that the opinion of a medical officer should be obtained on the important questions of heating and ventilation, drainage, sewerage, and plumbing fixtures. These are points where the special knowledge of a medical officer would be of great value, and it is far better and more economical to build a post right than to have to make subsequent expensive alterations.

### INSTRUCTION OF THE LINE OF THE ARMY IN SANITATION.

Ultimately, however, the responsibility for the sanitation of the Army rests upon the line, the Medical Department having no power to enforce their recommendations. Therefore the study of military hygiene should be enforced at the Military Academy at West Point, and I have recommended that it be made a part of the regular course at that school, counting for class standing and graduation.

### SANITATION IN THE FIELD.

Typhoid fever and diarrheal diseases, the two classes of maladies which most seriously threaten the efficiency of troops in the field, the former more especially in temperate climates, the latter in the Tropics, must be combated by the means that modern science has placed at our disposal for the purpose.

Though it is probably impossible to entirely prevent these diseases in the field, yet it is possible to control them, and not only possible but absolutely necessary to do so.

The exhaustive investigations of the typhoid fever board of 1898 have shown that the disease is so widespread in the United States that no large body of troops, even of the size of a regiment, in the case of volunteers, could be brought together without introducing typhoid fever; also, that before a case comes under observation it may have existed some time, meanwhile scattering abroad the seeds of infection, hence the futility of attempting to disinfect the feces of patients only. Our aim should always be to disinfect all urine and feces from the sick as well as from the apparently well, and also to disinfect promptly all infected clothing, bedding, tentage, etc. These measures together with arrangements for furnishing all soldiers with sterilized water would secure a large degree of protection; to carry them out special apparatus must be provided in time of peace.

With troops on the march the objectionable pit system for disposal of excreta and wastes is the only one practicable at present, but for camps of more than a few days' duration, all excreta must be disinfected at once and before disposal, and for this purpose, when water-carriage is not available, nothing better is known at present than the limewater trough system with odorless excavator adopted for the use of the Army in General Orders, No. 170, Adjutant-General's Office, 1899.

For the disposal of kitchen and other refuse some form of transportable destructor or cremator must be used.

Even on the march pure water can be supplied. Sterilizing apparatus on wheels capable of purifying sufficient water for a regiment can be drawn by two animals. All armies of importance have special water carts, and the most progressive are supplying themselves with the sterilizing apparatus.

It is recommended that one or more transportable garbage destructors, water carriers, water sterilizers, and disinfecting plants be purchased for trial under service conditions, and that a board be thereafter appointed to consider the whole matter.

## TOILET PAPER.

The issue of toilet paper is now authorized where posts have sewer connection. Its issue to posts having earth-closets or pits is still more important for sanitary reasons; the soft toilet paper allows stools to be kept covered by earth, while other stiffer sorts render this impossible, so that flies can gain access to typhoid or other stools.

## PHYSICAL TRAINING.

During the last year considerable more attention has been paid to athletics, post and department competitions being generally held, but systematic physical training in the sense used in foreign armies is still lacking. For years every effort has been made to develop the soldier's weapon, while very little has been done to develop the physical efficiency of the soldier himself. In all important foreign armies systematic physical training is considered one of the most essential features of the soldier's training, and is under skilled medical supervision. The course of instruction should be prescribed in orders and the necessary building and apparatus provided for by regular appropriation. Schools for the training of instructors, commissioned and noncommissioned, should be established in connection with the service schools at Forts Riley and Leavenworth, Kans.; and Fort Monroe, Va., and a detail made each year from regiments and other organizations for the purpose of providing a regular supply of qualified instructors.

### POST LAUNDRIES.

Recommendations have been made from a number of posts looking to the establishment of steam laundries with a view to placing work of this character under military control. Such a step is recommended as a sanitary measure of much importance to prevent the introduction of infectious diseases, to secure cleanliness of the soldiers' clothing, and economy in cost to the soldier. At present the soldier has his washing done wherever he pleases, usually at the cheapest place, which is very commonly one of the shacks just outside of the post, where contagious diseases frequently exist unknown to the authorities. The laundry work is of the crudest character and often delayed, so that a soldier who is admonished about dirty underwear is able to make the excuse that his laundress has failed him.

Post laundries might be operated either by the Quartermaster's Department or as a feature of the post exchange; if by the post exchange it is believed that at the present average cost of laundry work to the soldier, $1 per month, a dividend would result to the exchange.

### ANEMIA COMMISSION AND LABORATORIES FOR ORIGINAL RESEARCH.

The commission for the study and treatment of anemia in Porto Rico, Capt. Bailey K. Ashford, assistant surgeon, U. S. Army, president, whose valuable work was referred to in my last report, completed its work in August and submitted its report in December. The commission finds that the anemia of Porto Rico is due to a special disease, uncinariasis, which affects about 90 per cent of the rural inhabitants of the island, and that it can be restricted or eliminated by prevention of soil pollution by use of latrines and by treatment of existing cases.

In March, 1905, the governor of Porto Rico made a request for the services of Captain Ashford as chairman of the commission to be appointed to study and treat cases of uncinariasis in the island of Porto Rico, and the detail was promptly made by direction of the Secretary of War.

The work of the commission suggests the importance of undertaking similar investigations for the protection of our troops from the special diseases of the Tropics, concerning which there is so much yet to be learned.

The practical value from an economic point of view of efforts to prevent diseases, though well known, are hardly realized outside of the profession of medicine; there is too much disposition to consider only the first cost, and to regard results largely as ideal and not as providing ample justification for the expenditures.

That tropical diseases should be thoroughly studied with a view to preventing and finally extinguishing them it is necessary that thoroughly competent medical officers should give their whole time to the matter and work out the problem on the spot. To this end laboratories for original research should be established in the Philippines, with liberal provision for field parties to go into the districts particularly infected and study there the conditions which favor the existence of the diseases and which must be remedied to secure their suppression.

Work of this character has been done by the British Government in connection with her tropical colonies, and results have been obtained of the greatest importance in the prevention and control of tropical diseases.

### MEDICAL OBSERVERS WITH RUSSIAN AND JAPANESE ARMIES.

February 10, 1904, request was made for the detail of two medical officers of the Army to accompany the Russian and Japanese armies to the seat of war as observers. This request was disapproved at the time, but in October, 1904, Col. Valery Havard, assistant surgeon-general, was detailed for duty with the Russian army, and Capt. Charles Lynch, assistant surgeon, General Staff, for duty with the Japanese army. Both of these officers promptly proceeded to their posts. Later, Colonel Havard was replaced by Col. John Van R. Hoff, assistant surgeon-general.

Very respectfully,

R. M. O'Reilly,
*Surgeon-General, U. S. Army.*

The Secretary of War.

# REPORT OF THE PAYMASTER-GENERAL.

# REPORT OF THE PAYMASTER-GENERAL.

War Department,
Paymaster-General's Office,
*Washington, September 12, 1905.*

Sir: I have the honor to submit the following report for the fiscal year ending June 30, 1905:

| | |
|---|---|
| On July 1, 1904, officers of the Pay Department were charged with public funds aggregating | $2,989,970.22 |
| During the fiscal year these officers received— | |
| From the United States Treasury | 32,092,937.50 |
| From soldiers' deposits | 1,531,019.80 |
| From army paymasters' collections | 798,481.27 |
| Total balances and receipts | 37,412,408.79 |

Accounted for as follows:

| | |
|---|---|
| Expended on account of pay of the Army | $31,361,131.65 |
| Expended on account of mileage to officers and contract surgeons | 412,235.14 |
| Expended on account of encampment and maneuvers, organized militia | 238,200.88 |
| Expended on account of Army War College | 16,308.16 |
| Expended on account of pay of Military Academy | 408,886.17 |
| Total expenditures | 32,436,762.00 |
| Surplus funds deposited to credit of United States Treasurer | 1,208,094.72 |
| Army paymasters' collections deposited to credit of United States Treasurer | 798,481.27 |
| Balances charged to officers June 30, 1905 | 2,969,070.80 |
| Total accounted for | 37,412,408.79 |

Note.—At date of this report accounts current for June had not been received from the following-named officers, whose balances at dates indicated were as follows, and are included in "balances charged to officers June 30, 1905:"

| | |
|---|---|
| Maj. W. Y. Stamper, acting paymaster, Fort St. Michael, Alaska, June 19, 1905 | $13,089.37 |
| Capt. Charles Lynch, acting paymaster, Manchuria, China, November 30, 1904 | 2,636.00 |
| Capt. W. S. Guignard, special disbursing agent, Pay Department, United States Army, Paris, France, May 31, 1905 | 965.47 |
| Total | 16,690.77 |

## GENERAL REVIEW.

The money appropriated by Congress for the payment of the Army for the fiscal year amounted to $30,510,364.88.

The amount involved in the transactions of the Department for the year reached the gross sum of $70,974,856.33, of which $2,989,970.22 was on hand July 1, 1904, and $2,969,070.80 remained on hand June 30, 1905.

Detailed statements showing the transactions of the individual disbursing officers and accounting in detail for this sum are subjoined in tabular form.

All public funds put into the hands of disbursing officers have been satisfactorily accounted for. All troops, wherever stationed, have been regularly and promptly paid. Monthly payments have been extended to the whole Army.

The officers of the Department have been faithful and energetic in the performance of their duties, and I can again express my gratification that no complaints have been received of delayed payments because of neglect on the part of paymasters.

The work of this office has been faithfully and efficiently performed and is kept well up to date. The permanent clerical force is wholly insufficient for giving to the disbursing accounts received for examination that thorough administrative scrutiny which it has always been the aim of this office to give to the money papers of all officers handling funds pertaining to the Pay Department.

## MILITIA.

The organized militia when engaged under section 14, act January 21, 1903, in actual field or camp service for instruction is paid by State disbursing officers named by the governors. When participating, under section 15 of the same act, in encampments, maneuvers, etc., with the Regular Army, they are paid by army paymasters. The accounts rendered by both these classes of disbursing officers in connection with the payments indicated receive their administrative examination in this office, thus considerably increasing the work. These accounts show progressive improvement in the preparation of the rolls on the part of company commanders, and on the part of the State disbursing officers a more accurate knowledge of the laws and regulations under which Pay Department funds are disbursed.

## RIFLE PRACTICE.

Since March 2, 1903, expert riflemen thereafter qualifying have received $1 per month additional pay. Under present regulations this continues for a period of three years if the soldier during that time remains a member of an organization armed with the rifle or carbine. The extension from one to three years of the time for which the additional pay accrues under one qualification was a step in the right direction and placed the men on the same basis in that respect as gunners of the Artillery Corps. The incentive to good marksmanship among the enlisted men should be increased by an increase in the reward for good shooting, for on that in time of war depends the issue of battle. Rifle shooting among civilians is being encouraged by the War Department. Army ranges are thrown open to organized rifle clubs and magazine rifles and ammunition sold to them at cost. It seems to me that anything which increases the skill in shooting of the leaven which each year goes out from the Regular Army to civil life is worth the effort and the very small cost it entails. I therefore renew the recommendation in my last annual report that expert riflemen be allowed $3 per month extra, sharpshooters $2 per month, and marksmen $1 per month.

### PAYMENT OF POSTS AND STATIONS.

The system of paying troops at posts generally by express was found not to work advantageously. Therefore the posts paid from each pay station were arranged in one or more trips with a view to economy and expeditious payment. This schedule was approved and appears in General Orders, No. 154, War Department, 1904. It gives entire satisfaction, enabling the paymaster to quickly clear up any ambiguities appearing on the rolls and to impart such information as may be called for relative to payments made and to be made.

The two companies of the Tenth Infantry stationed at Honolulu, Hawaii, are paid by express from San Francisco, and the Porto Rico Provisional Regiment of Infantry by express from New York. The troops in the Philippine Islands are paid by personal visits of the paymasters. The posts in Alaska are paid monthly by the respective commanding officers from funds shipped to them yearly. The usual paymasters' accounts are prepared by these commanding officers and transmitted to this office at stated intervals. This arrangement has worked with gratifying success, and no further complaints in matters of payment are received from the troops stationed in that territory. The legation guard, at Peking, China, is similarly paid.

### ALLOTMENTS.

The principal object of the allotment law is to furnish a safe means whereby enlisted men on distant duty may, as expeditiously as possible, put into the hands of those dependent on them for support such part of their pay as they may desire to contribute for that purpose.

Enlisted men wishing to put away money for their own savings can find in the deposit system ample and absolutely safe means of doing so. The allotment system calls for careful and unremitting attention from the Pay Department to protect the Government from loss through payments to allottees where corresponding collections have not been made from grantors. Even though payment of an allotment is deferred for one month from the date when the soldier's pay falls due there is still possibility of erroneous payments. At times men who have allotments running leave the service unexpectedly at remote stations, thus of course terminating their allotments, and for one reason or another report of the fact may not reach the Paymaster-General's Office until the month's leeway has expired and the allotments have been paid. The percentage of ultimate loss to the United States is very small, measures being taken to have losses made good when the responsible party is in the service.

If the system is to be retained as a permanency it should be restricted in its operations to the principal object hereinbefore set forth; and if thus limited it will be a beneficial agency and should be encouraged in all reasonable ways. I therefore recommend that the privilege of making allotments of pay be limited to those desiring to make provision for dependents. The Army Regulations of 1904 make it the duty of the immediate commanding officers of enlisted men to see that no allotments are made for the purpose of securing advances on pay, yet the allotment rolls coming into this office indicate that the practice has not been entirely stopped.

Under the present regulations allotments are not to be suspended—they must be either paid or discontinued.

## DEPOSITS.

*Number and amounts of deposits received from and repaid to soldiers on discharge from July 1, 1872, to June 30, 1905.*

| Fiscal year ending June 30— | Deposits received. | | Deposits repaid. | | |
|---|---|---|---|---|---|
| | Number. | Amount. | Number. | Principal. | Interest. |
| 1873 | ........ | $209,850.38 | ........ | ........ | ........ |
| 1874 | ........ | 346,609.56 | ........ | ........ | ........ |
| 1875 | ........ | 325,255.80 | ........ | ........ | ........ |
| 1876 | ........ | 435,912.68 | ........ | ........ | ........ |
| 1877 | 5,524 | 328,585.05 | 14,752 | $1,041,001.57 | $49,713.89 |
| 1878 | 5,524 | 346,243.94 | 3,182 | 145,667.91 | 88,420.24 |
| 1879 | 6,087 | 470,770.38 | 4,926 | 257,854.48 | 17,706.93 |
| 1880 | 8,635 | 477,174.44 | 8,084 | 392,568.93 | 30,680.97 |
| 1881 | 8,942 | 524,112.72 | 8,148 | 501,949.77 | 38,722.62 |
| 1882 | 6,890 | 448,561.83 | 7,570 | 428,482.44 | 31,658.73 |
| 1883 | 7,902 | 407,544.68 | 6,695 | 363,578.34 | 26,123.60 |
| 1884 | 7,114 | 389,267.55 | 8,184 | 404,291.57 | 31,124.93 |
| 1885 | 7,033 | 427,617.96 | 6,930 | 401,902.22 | 38,249.44 |
| 1886 | 7,261 | 469,031.55 | 7,835 | 490,506.79 | 46,583.23 |
| 1887 | 6,889 | 436,574.98 | 6,988 | 389,083.12 | 34,758.24 |
| 1888 | 7,409 | 386,944.10 | 6,346 | 323,952.97 | 29,327.01 |
| 1889 | 7,892 | 383,798.34 | 7,664 | 396,468.53 | 33,647.38 |
| 1890 | 7,634 | 395,128.82 | 7,206 | 411,039.74 | 41,596.60 |
| 1891 | 6,790 | 403,473.15 | 9,106 | 553,047.45 | 51,797.70 |
| 1892 | 5,570 | 334,464.70 | 8,019 | 410,873.15 | 38,894.26 |
| 1893 | 5,870 | 282,248.04 | 5,317 | 268,835.46 | 26,059.07 |
| 1894 | 5,914 | 361,830.76 | 5,786 | 290,088.98 | 27,014.32 |
| 1895 | 6,284 | 318,270.73 | 5,880 | 308,372.45 | 28,766.42 |
| 1896 | 8,778 | 420,338.87 | 6,486 | 359,200.43 | 38,614.66 |
| 1897 | 17,878 | 535,392.64 | 6,976 | 345,559.55 | 34,850.53 |
| 1898 | 21,856 | 613,513.51 | 17,377 | 561,518.64 | 45,815.61 |
| 1899 | 37,842 | 1,496,762.31 | 28,508 | 988,774.63 | 61,273.95 |
| 1900 | 91,461 | 3,215,544.66 | 27,571 | 1,028,146.34 | 43,234.89 |
| 1901 | 111,004 | 3,438,529.11 | 78,948 | 2,955,169.39 | 114,750.37 |
| 1902 | 80,833 | 2,660,250.66 | 129,271 | 3,708,820.19 | 190,957.77 |
| 1903 | 61,948 | 1,888,014.37 | 59,968 | 2,134,191.91 | 123,298.48 |
| 1904 | 59,970 | 1,585,687.60 | 62,198 | 1,838,105.64 | 107,032.95 |
| 1905 | 51,382 | 1,531,019.80 | 74,352 | 2,010,526.80 | 122,205.52 |
| Total | ........ | 26,294,325.67 | ........ | 23,709,579.39 | 1,512,880.31 |
| Amount remaining to credit of depositors | ........ | 2,584,746.28 | ........ | ........ | ........ |

NOTE.—Repayment of deposits to soldiers from July 1, 1872, to June 30, 1876, were not recorded by fiscal years. The repayments of 1877 include all deposits repaid prior thereto.

The above table gives a complete history of soldiers' deposits since the passage of the act authorizing them May 15, 1872. As will be seen by reference to the table, the number and amount of the deposits varied comparatively little from the beginning of the system until the fiscal year of 1897 and the breaking out of the Spanish war.

From the foregoing table it will be seen that the enlisted men deposited during the year $1,531,019.80, making the total amount deposited since the passage of the law $26,294,325.67.

The law is very beneficial to the men, affording them the means of investing their savings in an absolutely safe way. Such restrictions should be thrown around a soldier's deposit book as to render it valueless for purposes of hypothecation.

## COMMUTATION OF QUARTERS.

I beg to invite attention to the remarks on this subject in the last annual report of the Paymaster-General and to again earnestly recommend that legislation be had increasing the commutation of quarters for officers. It is immaterial whether this increase takes the form of an increase in the number of rooms or an increase in the rate per room. It is a lamentable truth that an officer who receives an assignment to duty without troops at a place where public quarters are not owned by the United States obeys his order at a loss for every month of service, and if he has a family this loss is considerable. The increase in the cost of material and labor has so increased the cost of building that rents are far above what they were when the present number of rooms and rate per room were fixed.

## DETAILS FROM THE LINE.

The present law against permanent appointments in the staff corps and departments will result in course of time in all the grades in the Pay Department being filled by officers detailed from the line. I believe such a condition will be found not to work satisfactorily either to the officers and men depending on the paymasters for their pay and allowances, or to the officers detailed as paymasters.

I, therefore, recommend that the law be so amended as to limit details to vacancies occurring in the grade of captain, for which captains of the line should be selected as now. By section 26, act of February 2, 1901, the continuous detail to the staff corps of line officers above the grade of major is permitted. In my opinion this law should be changed, making all grades above captain permanent appointments. Vacancies in the grade of major should be filled by permanent appointments of captains, who, as detailed paymasters, have demonstrated their entire fitness physically, morally, and mentally. These permanent appointees should be eligible to promotion to include the grade of colonel.

The tendency of the age is to specialization. The tendency of the detail system when applied to an entire department is to diffusion. Pay Department funds are disbursed under numerous laws, regulations, and decisions, diverse in their character and complex in their nature. They can be learned and correctly applied only after long experience in their use. The character of many of the claims presented to an army paymaster for settlement are such as requires a fundamental knowledge of all the bases of such demands, a thorough familiarity with the customs and usages of the department, and these are only acquired in the actual consideration of claims which must be paid, or on which payment must be declined, with reasons for refusal to pay.

For these reasons the lower grades in the department should be filled by men in the prime of life, carefully selected because of demonstrated character and ability, and who are willing to become hard students of the literature of the department. To encourage men of the caliber noted to apply for detail in the Pay Department, there should be held out an incentive in the shape of a permanent appointment when the ability and determination to fill the requirements have been shown.

Men above the age of 50, the age at which the average officer may expect his majority, do not as readily acquire a mastery of a comparatively new subject as do younger men. For this reason I am not in favor of details in the department above the grade of captain.

The captains of the line who have served in the Pay Department by detail have been efficient and zealous and have discharged their duties in an eminently satisfactory manner.

### CLOTHING SETTLEMENTS.

As this office has much to do with clothing settlements, perhaps some remarks on the subject may not be out of place. As these settlements are considered the most difficult with which a company commander has to deal, and as, in the nature of things, they must be more or less complicated, any plan or system by which the method of keeping the clothing accounts, and entering therein the credits due the United States or the soldier, can be simplified, must of necessity be of interest to the service. Experience both as a company commander and a paymaster leads me to believe this can be done, and I beg, therefore, to submit the following views on the subject.

In the first place it may be assumed that the present clothing allowance is liberal and sufficient. I judge this to be the case since during the fiscal year 1904 the amount paid discharged soldiers for clothing undrawn amounted to $583,113.36, while the collections from the entire Army for clothing overdrawn amounted to $199,343.28 during the same period of time. But these figures can not be regarded as an exact criterion, because the first amount represents payments to the soldier for a period of three years while the second only covers the collections during a period of one year.

From the earliest data, of which there is record in this office, it appears that the fact that a soldier needs a greater allowance of clothing during the first year of his enlistment than during any subsequent year has always been recognized. It is recognized at the present time to a greater extent than ever, but not to my mind to the extent it should be. Those of us who have commanded companies know full well that the principal charges against the soldier on the muster and pay rolls for clothing overdrawn occur at the first settlement after his enlistment, and we know, too, that in a great majority of cases the soldier is in no way to blame for it. That this has been a cause of dissatisfaction and complaint and a possible cause of desertion in the past I have no doubt, and any change tending to ameliorate these conditions must, in my judgment, inure to the benefit of the service.

My plan, briefly outlined, is as follows: Give the soldier, upon his final acceptance by the United States Government, an immediate credit of the money value of his first outfit of clothing and a monthly allowance thereafter to maintain it in proper condition to the end of his enlistment or the date of his discharge. I would abandon all half-yearly and yearly allowances and consider only the allowance for the three consecutive years of an enlistment.

Furthermore, I would eliminate from the clothing allowance such articles as collar and cap ornaments, etc., and treat them as expendible articles, as is done in the case of many other things now borne upon the property returns of officers of the Quartermaster's Department.

To illustrate: The allowance of clothing for three years for a private of infantry, according to General Orders 105, War Department, 1905, is $161.10. Assume that immediately upon his acceptance into the United States Army the recruit (infantry) must be provided with a complete outfit, comprising the allowance for the first six months, the total cost of which is $69.82. Deducting this amount from the total for three years as given above and we have $91.28 remaining as the balance of credit to which the soldier will thereafter be entitled; and this last sum divided by 36 gives a monthly allowance of $2.54. The daily allowance, if there is to be one, should be obtained by dividing the monthly allowance by 30.

I do not pretend that the foregoing allowance, as constituting the first outfit of the recruit, is correct or absolute; I prefer to leave that question to be settled by officers more recently in command of troops. I simply contend that the initial issue of clothing to the soldier is as much a part of his military equipment as the rifle he carries or the horse he rides, and being required to supply himself with all the articles of clothing necessary for the performance of full military duty, it is only fair and just to him to supply them at the expense of the Government; and to this end their money value should constitute a credit in his clothing account as of the first day of his enlistment.

Were the prices of the different articles of clothing constant—that is, if they did not vary with the contract prices during the several fiscal years—no further explanation of this proposition would be necessary; but this difficulty vanishes if we only remember that the soldier gets the initial allowance but once during his enlistment period. For instance, take the case of a soldier who enlists on the 1st day of May. The total value of the allowance of clothing for three years on that date is, say, $175 and the initial allowance $75. There remains, then, $100 to be divided up among the thirty-six months of his enlistment, or a little more than $2.77 per month. On June 30, therefore, the first settlement date, he is entitled to a credit of $75 plus $5.55, or $80.55, in his clothing account. The next year the total allowance is $165 and the initial allowance $70. During this year, then, the monthly allowance would be one thirty-sixth of $95, or nearly $2.64 per month, and he would be credited with $15.83 in his clothing account on June 30 and December 31 of that year. The monthly allowances for subsequent years would be obtained in the same manner.

This scheme would be absolutely fair and equitable, since, no matter how much the price of clothing might increase or diminish, the monthly allowance would buy just as many articles in one case as in the other, and it has the merit of simplicity because each soldier of any particular grade in the Army would receive identically the same allowance during any given fiscal year as all other soldiers of like grade in the service.

Settlements should be made, as now, on the 30th of June and the 31st of December of each year, and the money value of any clothing overdrawn should be charged against the soldier on the muster and pay rolls of the company to which he belongs on those dates. But no such charge should be made unless the total amount drawn exceeds the total credits up to the date of settlement. No credit for undrawn clothing is to be noted on the rolls until after the soldier's discharge.

It seems to me that the above plan does only exact justice to the soldier and at the same time is absolutely fair and equitable to the Government, in that it does not involve the expenditure of one additional dollar in money. Naturally the clothing accounts of the men now in the service would have to be settled under existing regulations; but I see no reason why the new scheme might not be put into operation on any coming January 1 or July 1 in cases of men thereafter enlisting.

This method of settling clothing accounts, though revolved in my mind for many years, has not hitherto been suggested for adoption because of its wide variance with the systems in vogue until the existing one was ordered. My plan does not differ widely from the present practice, and I offer it for consideration in the belief that it may be found to have some commendable features.

## PAY OF ENLISTED MEN.

That the Army is underpaid, especially in the case of enlisted men, is too well known to require demonstration. It may be a fact that the American soldier is better paid, better fed, and better clothed than are soldiers of other countries, but this is a fallacious argument and unworthy of a place in any discussion of the subject, because it is equally a fact that before he joined the colors he was better paid, better clad, and better housed than the class of citizens of foreign countries from which the recruits for their armies are drawn. The true basis of comparison should be with the condition of his compeers in civil life; is he as well paid considering the duties he has to perform, and is he as well off at the end of his enlistment as he would have been had he not entered the military service? The complicated machinery of the modern armament requires thinking, educated men—a class to whom the present rate of pay offers but slight inducement to enter the service in times of prosperity.

The last complete pay schedule for the Army was passed by Congress in the year 1870, or thirty-five years ago, and, while liberal at the time of its passage, is now altogether inadequate. During the period named there has been an enormous increase in the rates of wages paid in all branches of labor in civil life with which salaries paid to our soldiers have not kept pace.

While much has been done to make the service more attractive in the way of better clothing, better quarters, amusement rooms, etc., it must still be remembered that at the end of each month we put into the hands of the private soldier but $13 as the result of his month's work. In this connection it may be of interest to note that at the close of the wars in which the United States has engaged the privates of the three arms of the service were receiving the following monthly rates of pay:

| | |
|---|---|
| Revolutionary war: | |
| Cavalry and artillery | $8.33 |
| Infantry | 6.67 |
| War of 1812: All three arms | 8.00 |
| Mexican war: | |
| Cavalry | 12.00 |
| Artillery and infantry | 11.00 |
| Civil war: All three arms | 16.00 |
| Spanish-American war: All three arms | 13.00 |

A complete schedule of the rates of pay would take up more space than it is thought desirable to use for such purpose in an annual report, and it is, therefore, my intention to submit later for consideration a schedule based on present conditions.

The following data, carefully prepared under my direction, show the relative cost of the Army during the fiscal years 1875 and 1905:

| | 1875. | 1905. |
|---|---|---|
| Total amount carried by the appropriation | $27,738,500.00 | $76,490,845.88 |
| Total officers and enlisted men, active and retired | 27,954 | 75,815 |
| Per capita cost | $992.29 | $1,008.91 |
| Per capita cost, officers | $3,271.82 | [a] $3,368.57 |
| Per capita cost, enlisted men | $768.01 | $860.35 |
| Total officers and men, active list | 27,654 | 72,746 |
| Per capita cost | $972.03 | $1,007.86 |
| Per capita cost, officers | $3,328.00 | [a] $3,308.81 |
| Per capita cost, enlisted men | $768.01 | $874.48 |
| Percentage of officers to enlisted men, active and retired | 8.957 | 6.426 |
| Percentage of officers to enlisted men, active | 7.97 | 5.48 |

[a] These items comprise pay and allowances and the proper proportion of the amounts appropriated for the Quartermaster's, Subsistence, Medical, Signal, Engineer, and Ordnance departments.

In the appropriation for 1905 are included many items which do not appear in the appropriation bill for 1875, such as $1,000,000 for the militia, $321,580 for the Alaskan cable, $300,000 for War College buildings, etc., totaling $1,664,580, which being permanent in their character, and having no bearing on the annual expenditures, should be excluded from any calculations having in view a comparative statement of the relative cost of the military establishment at the present time and thirty years ago. Eliminating these items the following results are obtained:

| | 1875. | 1905. |
|---|---|---|
| Total appropriation | $27,738,500.00 | $74,826,265.88 |
| Total officers and enlisted men, active and retired | 27,954 | 75,815 |
| Per capita cost | $992.29 | $986.96 |
| Per capita cost, officers | $3,271.82 | [a] $3,345.70 |
| Per capita cost, enlisted men | $768.01 | $837.48 |
| Total officers and men, active list | 27,654 | 72,746 |
| Per capita cost | $972.03 | $984.98 |
| Per capita cost, officers | $3,328.00 | [a] $3,285.94 |
| Per capita cost, enlisted men | $768.01 | [b] $851.61 |
| Average pay of officers, active list | $2,234.10 | $2,209.45 |
| Average pay of enlisted men, active list | $191.74 | $187.20 |
| Per capita cost of clothing, enlisted men | $58.11 | $58.17 |
| Per capita cost of travel pay to discharged soldiers | $26.83 | $21.81 |

[a] These items comprise pay and allowances and the proper proportion of the amounts appropriated for the Quartermaster's, Subsistence, Medical, Signal, Engineer, and Ordnance departments.

[b] If the appropriations for ordnance and transportation had no more than kept pace with the increase in the Army, the individual cost for 1905 would be $746.74 instead of $851.61, or an excess for 1875 over 1905 of $21.27.

## PERSONNEL.

From July 1, 1904, to June 30, 1905, changes in Pay Department officers occurred as follows:

### PROMOTIONS.

Maj. John L. Bullis, paymaster, promoted brigadier-general, United States Army, April 13, 1905; Capt. George E. Pickett, paymaster, promoted major, paymaster, September 6, 1904; Capt. Otto Becker, paymaster, promoted major, paymaster, January 15, 1905; Capt. Manly B. Curry, paymaster, promoted major, paymaster, April 13, 1905.

### COMMISSION AS PAYMASTER VACATED.

By Maj. John L. Bullis, paymaster, on appointment as brigadier-general, United States Army, April 13, 1905.

### RETIREMENT.

Maj. Jerome A. Watrous, paymaster, September 6, 1904.

### DISMISSED.

Maj. Harry L. Rees, paymaster, January 15, 1905.

### DETAILS FROM LINE.

Capt. Henry B. Dixon, cavalry, September 17, 1904.
Capt. Earl C. Carnahan, infantry, February 3, 1905.
Capt. Thomas M. Moody, infantry, April 11, 1905.
Capt. William S. Valentine, cavalry, April 23, 1905.
Capt. George J. Holden, infantry, May 13, 1905.

### DETAILED PAYMASTERS RELIEVED.

Capt. William F. Blauvelt, infantry, April 11, 1905, detail terminated by promotion to major in the line.

Capt. Herbert S. Whipple, cavalry, April 23, 1905, on completion of four years' detail.

*Mileage disbursements for the fiscal year ending June 30, 1905.*

| | Pay of the Army. | | Mileage. |
|---|---|---|---|
| | 1903. | 1904. | 1905. |
| Inspection of the Army: | | | |
| By the General Commanding the Army, accompanied by his aids, and the generals commanding the several military departments, accompanied by officers of their staffs, as provided by paragraph 191, Army Regulations | | $432.32 | $12,411.69 |
| By officers of the Military Secretary's Department | | | 443.33 |
| By officers of the Inspector-General's Department | | 284.07 | 9,505.29 |
| By officers of the Quartermaster's Department | | 535.29 | 7,527.95 |
| By officers of the Subsistence Department | | 137.06 | 2,845.47 |
| By officers of the Medical Department | | 34.40 | 2,034.96 |
| By officers of the Ordnance Department | | 491.55 | 9,110.04 |
| By officers of the Engineer Department | | | 28.50 |
| By officers of the Signal Corps | | | 2,475.42 |
| By officers of the Artillery (artillery inspection) | | | 55.58 |
| Inspection by line officers of— | | | |
| Troops | | | 45.80 |
| Horses | | 181.68 | 805.12 |
| Engineer and other property | | | 76.86 |
| Artillery districts | $3.44 | 190.74 | 3,760.75 |
| Old ordnance | | | .56 |
| Submarine mines | | 34.30 | 1,132.65 |
| Colleges | | 34.70 | 1,697.79 |
| Militia | | 282.62 | 9,023.45 |
| Torpedoes | | | 65.24 |
| Gymnasiums | | | 131.11 |
| Range indicator for 10-inch B. L. R. disappearing carriage | | | 79.22 |
| Inspection of post schools | | | 720.34 |
| Inspecting work on fortifications by engineer officer | | | 380.00 |
| Total for inspection of the Army | 3.44 | 2,638.73 | 64,357.12 |

*Mileage disbursements for the fiscal year ending June 30, 1905*—Continued.

| | Pay of the Army. | | Mileage. |
|---|---|---|---|
| | 1903. | 1904. | 1905. |
| General recruiting duty | | $2,034.15 | $54,602.24 |
| Post recruiting | | 294.94 | 2,567.37 |
| Joining for and returning from recruiting duty | | 240.36 | 3,070.36 |
| Returning from conducting recruits | | 781.90 | 13,723.44 |
| Total for recruiting duty | | 3,351.35 | 73,963.41 |
| General Staff | | | 1,708.90 |
| Change of station | $216.64 | 7,175.13 | 116,606.55 |
| General Service and Staff College at Fort Leavenworth, Kans | 52.43 | 193.41 | 8,597.98 |
| Travel of general officers and their aids other than for inspection | | 180.13 | 528.33 |
| Travel in Europe and other foreign countries | | 383.23 | 3,156.82 |
| Courts-martial and courts of inquiry, to and from | 13.80 | 653.14 | 21,766.07 |
| Payment of troops | | 282.70 | 13,622.00 |
| Payment of militia | | | 30.81 |
| Officers of the line ordered to express offices to obtain money for payment of troops | | 8.04 | 53.76 |
| Treasurer and professors, Military Academy (Military Academy duty) | | | 280.23 |
| Instructions of Secretary of War (confidential duty) | | 1,029.12 | 5,352.95 |
| Target practice, inspection of target ranges and rifle teams | | 462.72 | 18,762.06 |
| Conducting prisoners, sick and insane | 5.50 | 392.50 | 3,244.65 |
| Line officers on business for Quartermaster's and Subsistence Departments | | 159.10 | 1,644.85 |
| Retiring boards and officers retired and ordered home | | 589.38 | 6,375.41 |
| Board of Ordnance and Fortification | | | 2,012.34 |
| Boards to examine officers for promotion | | 439.93 | 7,449.69 |
| Boards for examination of gunners | 4.70 | 205.22 | 604.68 |
| Boards for examination of officers at post schools | | 17.32 | 889.17 |
| Boards for survey | | 21.07 | 74.87 |
| Boards on wharf at Camp Overton, P. I | | 20.96 | |
| Boards on revision drill regulations, Coast Artillery | | | 69.92 |
| Boards on revision drill regulations, Field Artillery | | | 1,005.62 |
| Boards on water supply, Fort Andrews, Mass | | 1.70 | |
| Boards on horizontal base lines for fire control; paragraph 9, S.O. 78 | | 2.02 | 1,042.63 |
| Boards on military reservation, Indianapolis, Ind | | 47.11 | |
| Boards on military site, Columbus Barracks, Ohio | | 66.08 | |
| Boards on submarine mines | | | 224.67 |
| Boards to inspect steamer Major Evan Thomas | | | 91.18 |
| Boards to investigate damage to steam launch Captain De Hart | | | 7.98 |
| Boards on prison at Malahi Island, P. I | | | 2.48 |
| Boards to investigate cause of accident at mortar practice at Fort Banks, Mass | | | 51.61 |
| Boards on 3, 6, and 12 inch seacoast guns | | | 99.03 |
| Boards on Benicia Barracks, California | | | 19.44 |
| Boards on land for range-finding station at Fort Morgan, Ala | | | 89.92 |
| Boards on military site, Eagle Pass, Tex | | | 29.50 |
| Boards on testing provisional drill 5 and 6 inch R. F. guns | | | 97.82 |
| Boards to investigate cause of accident to the transport Burnside | | | 37.24 |
| Boards on searchlights | | | 78.62 |
| Boards on General Staff | | | 1,065.68 |
| Boards on land, Fort H. G. Wright, N. Y | | | .56 |
| Boards on purchase of land, Fort Sheridan, Ill | | | 18.20 |
| Boards on sonna water system, Boise, Idaho | | | 159.54 |
| Boards on physical training of cadets | | | 94.36 |
| Boards on testing sights, magazine rifle | | | 393.12 |
| Boards on road commission for Alaska | | | 59.43 |
| Leases and other legal business | | 1.65 | 906.75 |
| Topographical work | | | 129.16 |
| Exploration wild tribes, Mindanao, P. I | | 39.80 | |
| Information for artillery school at Fort Monroe, Va | | | 71.82 |
| Consultation with department and division commander | | 28.16 | 384.91 |
| Duty as engineer of department | | 58.48 | |
| Special investigation | 24.29 | 15.44 | 237.43 |
| Artillery instruction at Indian Head and navy-yard gun factory | | 228.48 | |
| Fire control and installation | | | 407.35 |
| Verifying Phillipine currency | | | 4.20 |
| Military surveys | | | 11.02 |
| Selection of camp grounds | | | 220.28 |
| Army and navy maneuvers | | | 5,627.38 |
| Army maneuvers at Manassas, Va | | 44.68 | 19,499.04 |
| Army maneuvers at American Lake, Washington | | 50.60 | 1,706.29 |
| Army maneuvers at Department of California | | 415.99 | 4,209.38 |
| Pursuit of deserters and escaped prisoners | | 17.38 | 66.05 |
| War College | | | 490.02 |
| Naval War College | | | 108.01 |
| Attending American Veterinary Medical Association | | | 57.68 |
| Attending American Railway Accounting Officers' Association | | 57.68 | |
| Attending Military Surgeons' Association | | | 265.58 |
| Attending Dental Congress | | | 112.94 |
| Attending International Congress of Education | | 244.81 | 203.35 |

*Mileage disbursements for the fiscal year ending June 30, 1905*—Continued.

| | Pay of the Army. | | Mileage. |
|---|---|---|---|
| | 1903. | 1904. | 1905. |
| Attending International Congress of Physiologists at Brussels | | | $587.02 |
| Attending International Electrical Congress at St. Louis, Mo | | | 125.16 |
| Attending National Rifle Association of America | | | 10.14 |
| Attending National Guard Association | | | 247.90 |
| Attending National Association for the Prevention and Study of Tuberculosis | | | 318.22 |
| Attending Public Health Association | | | 301.63 |
| Attending inauguration | | | 1,274.74 |
| Duty at the Louisiana Purchase Exposition | | | 4,004.36 |
| Accompanying the Filipino commissioners | | $524.90 | |
| Panama Canal | | | 397.04 |
| Witnessing movements Japanese-Russian armies | | 1,655.57 | 7,759.47 |
| Witnessing proof firing of new 3-inch field artillery gun | | | 2,831.43 |
| Construction of ballistic computer | | | 35.56 |
| Investigating best method of instruction in Spanish | | | 460.46 |
| Militia officers attending garrison and service schools | | | 2,297.44 |
| In charge of insular funds | | | 33.33 |
| Test of mortar elevation indicator | | | 48.36 |
| Army Medical School | | | 28.00 |
| Conference with Chief Engineer | | | 166.62 |
| Conference with General Staff | | | 763.31 |
| Flood sufferers | | | 7.28 |
| Department athletics and athletic tournament | | | 393.58 |
| Accompanying the Vice-President of Mexico | | | 52.36 |
| Lecture on Gettysburg | | | 50.02 |
| Examination of accounts of paymasters | | | 28.00 |
| Lewis and Clark Exposition | | | 55.44 |
| Competition for Gould trophy | | | 34.58 |
| Conference with governor-general of the Philippines | | | 49.00 |
| Baseball team | | | 9.66 |
| Reception to commanding officer German cruiser Bremen | | | 7.56 |
| Escort for the President | | | 58.80 |
| Bid on location of cantonment at Baguio, P. I | | | 101.82 |
| Orders fail to state specific duty enjoined | | | 4.65 |
| Total | $320.80 | 21,703.71 | 413,052.78 |
| Paid by the Auditor for the War Department on Treasury settlement and chargeable to the mileage appropriation, 1905 | | | 2,020.42 |

*Comparative statement of some of the principal items for which mileage was paid in the fiscal years 1904 and 1905.*

| | 1904. | 1905. | Increase. | Decrease. |
|---|---|---|---|---|
| Inspection of the Army | $67,071.71 | $64,357.12 | | $2,714.59 |
| Change of station | 140,498.88 | 116,606.55 | | 23,892.33 |
| General service and staff college at Fort Leavenworth, Kans | 14,876.37 | 8,597.98 | | 6,278.39 |
| Recruiting duty | 88,777.08 | 73,963.41 | | 14,813.67 |
| Target practice, inspection of target ranges and rifle teams | 14,173.91 | 18,762.06 | $4,588.15 | |
| General Staff | 9,445.32 | 1,708.90 | | 7,736.42 |
| Courts-martial | 12,835.46 | 21,766.07 | 8,930.61 | |
| Retiring boards and officers retired and ordered home | 11,254.63 | 6,375.41 | | 4,879.22 |
| Boards to examine officers for promotion | 9,181.29 | 7,449.69 | | 1,731.60 |

Respectfully submitted.

F. S. Dodge,
*Paymaster-General, U. S. Army.*

The Secretary of War.

*Statement of the account of the Pay Department, United States Army, with the*

| Appropriations. | In account with the Treasury. | | | | | |
|---|---|---|---|---|---|---|
| | Balance in the Treasury July 1, 1904. | Amount of appropriations and transfer warrants. | Unexpended balances deposited. | Paymasters' collections deposited. | Repayments in settlement of accounts. | Total. |
| Pay, etc., of the Army, 1905 | | $30,565,200.33 | $0.43 | $421,255.67 | $307.54 | $30,986,763.97 |
| Pay of Military Academy, 1905 | | 451,584.42 | | 107.27 | | 451,691.69 |
| Mileage to officers and contract surgeons, 1905 | | 500,000.00 | | 753.10 | 80.50 | 500,833.60 |
| Army War College, 1905 | | 15,000.00 | | | | 15,000.00 |
| Encampment and maneuvers, organized militia, 1905 | | 300,000.00 | 27,786.75 | 22.05 | | 327,808.80 |
| Pay, etc., of the Army, 1904 | $38,802.41 | 105.69 | 1,012,297.56 | 148,157.69 | 652.41 | 1,200,015.76 |
| Pay of Military Academy, 1904 | 6,156.56 | | 17,564.37 | 8.80 | | 23,729.73 |
| Army War College, 1904 | 7,390.15 | | | | | 7,390.15 |
| Pay, etc., of the Army, 1903 | 3,429,654.06 | | 105,654.43 | 3,033.11 | 223.18 | 3,538,564.78 |
| Pay of Military Academy, 1903 | 22,973.57 | | | | | 22,973.57 |
| Pay, etc., of the Army, 1902 and prior years | | | 471.44 | 4,209.45 | 222.15 | 4,903.04 |
| Reimbursement to contract surgeons | 1,521.58 | | | | | 1,521.58 |
| Pay of two and three year volunteers, 1871 and prior years | | | | | 493.61 | 493.61 |
| Extra pay to volunteers, war with Spain | | 490,592.23 | | | 132.20 | 490,724.43 |
| Extra pay to Regular Army, war with Spain | 19,738.32 | | | | | 19,738.32 |
| Extra pay to officers and men who served in Mexican war | 729.00 | | | | | 729.00 |
| Bounty under act of July 28, 1866 | 100.00 | | | | 100.00 | 200.00 |
| CERTIFIED CLAIMS. | | | | | | |
| Pay, etc., of the Army | 3,305.38 | 13,914.89 | | | | 17,220.27 |
| Pay, etc., of the Army, war with Spain, 1905 | | 150,000.00 | | | 252.02 | 150,252.02 |
| Pay, etc., of the Army, war with Spain, 1904 | 132,962.65 | | | | 17.15 | 132,979.80 |
| Pay, etc., of the Army, war with Spain, 1903 | 96,990.69 | | | | | 96,990.69 |
| Arrears of pay, bounty, etc., 1905 | | 250,000.00 | | | 25.56 | 250,025.56 |
| Arrears of pay, bounty, etc., 1904 | 83,841.32 | | | | 8.66 | 83,849.98 |
| Arrears of pay, bounty, etc., 1903 | 53,250.17 | | | | 25.00 | 53,275.17 |
| Arrears of pay, bounty, etc., 1901 and prior years | 542.98 | | | | | 542.98 |
| Reimbursement to Maj. J. B. Houston, U. S. Army | | 333.00 | | | | 333.00 |
| Pay of volunteers | 47.60 | | | | | 47.60 |
| Pay of volunteers, Mexican war | | 77.04 | | | | 77.04 |
| Pay, transportation, services, and supplies of Oregon and Washington volunteers in 1855 and 1856 | | 1,271.66 | | | | 1,271.66 |
| Traveling expenses of California and Nevada volunteers | 256.51 | | | | | 256.51 |
| Bounty under act of July 11, 1862 | 25.00 | | | | | 25.00 |
| Judgments, Court of Claims (war) | 14,662.96 | 132,789.23 | | | | 147,452.19 |
| Total | 3,912,950.91 | 32,870,868.49 | 1,163,774.98 | 577,547.14 | 2,539.98 | 38,527,681.50 |

*appropriations subject to its control during the fiscal year ending June 30, 1905.*

| In account with the Treasury. | | | | | Balance in the hands of paymasters June 30, 1905. | Total balances June 30, 1905. |
|---|---|---|---|---|---|---|
| Amount drawn by requisition. | | Amount covered into surplus fund. | Total. | Balance in the Treasury June 30, 1905. | | |
| On Pay Department request. | On Treasury settlements. | | | | | |
| $30,842,400.00 | $28,782.38 | | $30,871,182.38 | $115,581.59 | $2,879,949.83 | $2,995,531.42 |
| 420,000.00 | 148.65 | | 420,148.65 | 31,543.04 | 37,878.12 | 69,421.16 |
| 436,600.00 | 1,808.85 | | 438,408.85 | 62,424.75 | 23,862.64 | 86,287.39 |
| 10,000.00 | 833.78 | | 10,833.78 | 4,166.22 | 1,489.91 | 5,656.13 |
| 266,937.50 | [a]55,394.49 | | 322,331.99 | 5,476.81 | 949.87 | 6,426.68 |
| 110,000.00 | 98,120.92 | | 208,120.92 | 991,894.84 | 24,612.82 | 1,016,507.66 |
| | 460.75 | | 460.75 | 23,268.98 | | 23,268.98 |
| 7,000.00 | 216.38 | | 7,216.38 | 173.77 | 327.61 | 501.38 |
| | [b]1,521,104.98 | $2,017,459.80 | 3,538,564.78 | | | |
| | | 22,973.57 | 22,973.57 | | | |
| | | 4,903.04 | 4,903.04 | | | |
| | 321.83 | | 321.83 | 1,199.75 | | 1,199.75 |
| | | 493.61 | 493.61 | | | |
| | 490,724.43 | | 490,724.43 | | | |
| | 5,190.40 | | 5,190.40 | 14,547.92 | | 14,547.92 |
| | 52.50 | 676.50 | 729.00 | | | |
| | | 200.00 | 200.00 | | | |
| | 13,914.89 | | 13,914.89 | 3,305.38 | | 3,305.38 |
| | 87,412.46 | | 87,412.46 | 62,839.56 | | 62,839.56 |
| | 2,026.42 | | 2,026.42 | 130,953.38 | | 130,953.38 |
| | 33.06 | 96,957.63 | 96,990.69 | | | |
| | 175,061.29 | | 175,061.29 | 74,964.27 | | 74.964.27 |
| | 6,346.00 | | 6,346.00 | 77,503.98 | | 77,503.98 |
| | 448.91 | 52,826.26 | 53,275.17 | | | |
| | | 542.98 | 542.98 | | | |
| | 333.00 | | 333.00 | | | |
| | | | | 47.60 | | 47.60 |
| | 77.04 | | 77.04 | | | |
| | 1,271.66 | | 1,271.66 | | | |
| | | | | 256.51 | | 256.51 |
| | | 25.00 | 25.00 | | | |
| | 141,693.81 | | 141,693.81 | 5,758.38 | | 5,758.38 |
| 32,092,937.50 | 2,631,778.88 | 2,197,058.39 | 36,921,774.77 | 1,605,906.73 | 2,969,070.80 | 4,574,977.53 |

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[a] Under authority of Assistant Secretary of War, by indorsement dated January 16, 1905, the sums of $45,000 and $10,000, unexpended balance, were transferred to credit of Quartermaster's Department January 16 and February 18, 1905, respectively.

[b] $1,500,000 of pay, etc., of the Army, 1903, was transferred to appropriations, by appropriation warrant No. 13, approved March 3, 1905, as follows: $1,400,000 to credit of pay, etc., of the Army, 1905, and $100,000 to credit of mileage to officers and contract surgeons, 1905.

*Statement showing the balance in the hands of each disbursing officer of the Pay Department, United States Army, on the 1st of July, 1904; the amount remitted to each from the United States Treasury, or turned over by other agents during the fiscal year ending June 30, 1905; the amounts accounted for by accounts and vouchers of expenditures, or by transfer or replacement in the Treasury, and the balance remaining in the hands of paymasters to be accounted for in the next fiscal year.*

| Rank and name. | Balance in hands of each paymaster on June 30, 1904. | Remitted from the Treasury in the year ending June 30, 1905. | Received from other paymasters. | Received from soldiers' deposits. | Received from paymaster's collections. | Total received and to be accounted for. | Surplus funds deposited in the Treasury. | Paymaster's collections deposited in the Treasury. | Expenditures. | Transferred to other paymasters. | Balance in hands of each paymaster on June 30, 1905. | Total accounted for. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Colonels and assistant paymasters-general.* | | | | | | | | | | | | |
| 1. Towar, A. S | $55,490.35 | $961,000.00 | $495,640.59 | $14,538.72 | $4,893.24 | $1,531,562.90 | $4,000.00 | $4,893.24 | $470,949.23 | $1,011,406.87 | $40,313.56 | $1,531,562.90 |
| 2. Sniffen, C. C | 165,355.29 | 4,941,500.00 | 437,874.46 | 8,036.13 | 5,261.64 | 5,558,027.52 | 48,396.81 | 5,261.64 | 1,558,254.11 | 3,737,087.31 | 209,027.65 | 5,558,027.52 |
| 3. Whipple, C. H | 99,309.12 | 8,074,000.00 | 1,523,828.98 | 4,509.18 | 7,748.45 | 9,709,395.73 | 29,234.16 | 7,748.45 | 2,193,602.86 | 6,963,012.35 | 515,797.91 | 9,709,395.73 |
| *Lieutenant-colonels and deputy paymasters-general.* | | | | | | | | | | | | |
| 1. Comegys, W. H | 248,980.69 | 4,315,942.50 | 662,730.14 | 4,000.00 | 4,250.17 | 5,235,903.50 | 234,969.34 | 4,250.17 | 1,109,465.33 | 3,793,756.98 | 93,461.68 | 5,235,903.50 |
| 2. Tucker, W. F | 27,680.51 | 3,016,995.00 | 1,124,715.81 | 478.45 | 355.77 | 4,170,225.54 | 443,647.99 | 355.77 | 43,418.60 | 3,373,349.67 | 309,453.51 | 4,170,225.54 |
| 3. Muhlenberg, J. C | .......... | 854,000.00 | 620,284.60 | 11,765.92 | 11,625.83 | 1,497,676.35 | 1,994.21 | 11,625.83 | 516,560.74 | 947,199.98 | 20,295.59 | 1,497,676.35 |
| 4. Smith, G. R | .......... | 1,325,000.00 | 1,892,862.44 | 18,175.00 | 1,150.78 | 3,237,188.22 | 370,000.00 | 1,150.78 | 255,929.86 | 2,581,128.26 | 28,979.32 | 3,237,188.22 |
| *Majors and paymasters.* | | | | | | | | | | | | |
| 1. Halford, E. W | 17,977.43 | 440,000.00 | 826,121.84 | 28,842.95 | 16,755.32 | 1,329,697.54 | 1,400.16 | 16,755.32 | 754,815.64 | 556,726.42 | .......... | 1,329,697.54 |
| 2. Bullis, J. L.[a] | .......... | 368,000.00 | 540,785.29 | 18,292.59 | 13,662.44 | 940,740.32 | 5,699.82 | 13,662.44 | 489,657.79 | 431,720.27 | .......... | 940,740.32 |
| 3. Rogers, H. L | 63,380.68 | 720,500.00 | 297,733.82 | 32,771.33 | 20,223.30 | 1,134,609.13 | 6,184.59 | 20,223.30 | 594,977.67 | 443,832.64 | 69,390.93 | 1,134,609.13 |
| 4. Watrous, J. A.[b] | 64,123.16 | 62,000.00 | 123,227.71 | 2,965.92 | 5,190.53 | 257,507.32 | .......... | 5,190.53 | 126,399.48 | 125,917.31 | .......... | 257,507.32 |
| 5. Rees, H. L.[c] | 60,590.78 | 145,000.00 | 183,017.69 | 6,082.26 | 5,826.80 | 400,517.53 | .......... | 5,826.80 | 211,498.86 | 183,191.87 | .......... | 400,517.53 |
| 6. Vinson, W | 51,665.14 | 815,000.00 | 2,143,895.75 | 30,982.66 | 23,946.90 | 3,065,490.45 | 743.86 | 23,946.90 | 817,191.22 | 2,189,441.48 | 34,166.99 | 3,065,490.45 |
| 7. Wallace, H. S | 25,690.37 | 715,000.00 | 884,967.89 | 26,373.04 | 23,588.84 | 1,675,620.14 | .......... | 23,588.84 | 918,160.11 | 704,725.15 | 29,146.04 | 1,675,620.14 |
| 8. Payson, F. L | .......... | 275,000.00 | 780,789.08 | 10,996.34 | 8,570.15 | 1,075,355.57 | .......... | 8,570.15 | 462,211.30 | 555,623.11 | 48,951.01 | 1,075,355.57 |
| 9. Downey, Geo. F | 80,368.75 | 376,000.00 | 584,674.07 | 34,863.72 | 23,143.74 | 1,099,050.28 | .......... | 23,143.74 | 635,021.21 | 374,342.85 | 66,542.48 | 1,099,050.28 |
| 10. Goodman, T. C | 50,556.58 | 1,160,000.00 | 480,096.55 | 31,824.45 | 19,265.69 | 1,741,743.27 | 11,987.50 | 19.265.69 | 894,629.22 | 669,955.13 | 145,905.73 | 1,741,743.27 |
| 11. Houston, J. B.[d] | .......... | .......... | .......... | .......... | .......... | .......... | .......... | .......... | .......... | .......... | .......... | .......... |
| 12. Ray, B. B | 3,468.11 | 226,000.00 | 669,154.58 | 11,589.00 | 10,662.48 | 920,874.17 | 1,403.37 | 10,662.48 | 431,223.08 | 456,009.89 | 21,575.35 | 920,874.17 |
| 13. Lord, H. M | 90,966.86 | 150,000.00 | 399,616.20 | 33,286.05 | 12,380.74 | 686,249.85 | .......... | 12,380.74 | 505,692.00 | 111,940.88 | 56,236.23 | 686,249.85 |
| 14. Rochester, W. B., jr. | 58,483.48 | .......... | 623,214.13 | 40,995.80 | 13,555.06 | 736,248.47 | 2,094.62 | 13,555.06 | 517,662.68 | 151,004.90 | 51,931.21 | 736,248.47 |
| 15. Smith, R. S | 19,782.52 | 75,000.00 | 571,372.46 | 34,142.07 | 30,060.24 | 730,357.29 | 8,422.84 | 30,060.24 | 599,284.15 | 92,590.06 | .......... | 730,357.29 |
| 16. Howell, Seymour | 6,119.43 | 263,000.00 | 453,858.66 | 33,373.12 | 25,417.31 | 781,768.52 | .......... | 25,417.31 | 574,266.08 | 182,085.13 | .......... | 781,768.52 |
| 17. Holloway, G. T | 35,168.41 | .......... | 717,862.58 | 15,823.36 | 17,933.06 | 786,787.41 | 147.14 | 17,933.06 | 685,943.22 | 81,294.90 | 51,469.09 | 786,787.41 |
| 18. Gambrill, W. G | 108,792.34 | .......... | 1,058,170.99 | 95,508.33 | 18.259.08 | 1,280,730.74 | .......... | 18,259.08 | 785,789.41 | 376,082.33 | 100,599.92 | 1,280,730.74 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19. Keleher, T. D | 71,460.66 | 1,040,000.00 | 373,197.71 | 30,004.80 | 12,560.10 | 1,527,223.27 | | 12,560.10 | 360,701.07 | 1,099,336.52 | 54,625.58 | 1,527,223.27 |
| 20. Schofield, W. B | 69,181.71 | | 365,003.80 | 55,367.13 | 10,756.55 | 500,309.19 | | 10,756.55 | 422,294.44 | 45,755.71 | 21,502.49 | 500,309.19 |
| 21. Pickett, G. E | 21,690.82 | | 807,913.35 | 32,078.70 | 26,177.90 | 887,860.77 | | 26,177.90 | 702,115.73 | 146,862.01 | 12,705.13 | 887,860.77 |
| 22. Becker, Otto | 24,040.07 | 170,000.00 | 340,081.81 | 11,169.92 | 12,182.88 | 557,474.68 | | 12,182.88 | 432,029.68 | 107,365.70 | 5,896.42 | 557,474.68 |
| 23. Curry, M. B | 25,283.37 | | 430,639.73 | 26,631.63 | 12,492.98 | 495,047.71 | | 12,492.98 | 424,186.26 | 28,368.47 | 30,000.00 | 495,047.71 |
| *Captains and paymasters.* | | | | | | | | | | | | |
| 1. Dawes, J. W | 94,708.00 | | 410,464.00 | 34,055.90 | 10,788.10 | 550,016.00 | | 10,788.10 | 336,285.01 | 135,995.05 | 66,947.84 | 550,016.00 |
| 2. Canby, James | 37,073.86 | 175,000.00 | 804,310.56 | 24,904.32 | 13,672.24 | 1,054,960.98 | 8.40 | 13,672.24 | 770,758.91 | 163,566.60 | 106,954.83 | 1,054,960.98 |
| 3. Coffin, Eugene | 68,847.26 | 390,000.00 | 422,424.37 | 33,730.46 | 22,470.71 | 937,472.80 | | 22,470.71 | 831,960.17 | 39,893.83 | 43,148.09 | 937,472.80 |
| 4. Lynch, J. R | 16,391.13 | 95,000.00 | 517,757.44 | 23,152.62 | 20,739.99 | 673,041.18 | | 20,739.99 | 551,834.09 | 42,098.60 | 58,368.50 | 673,041.18 |
| 5. Stanton, C. E | 136,803.67 | | 549,000.00 | 107,935.95 | 18,939.84 | 812,679.46 | | 18,939.84 | 692,089.17 | 81,787.02 | 19,863.43 | 812,679.46 |
| 6. Stevens, P. C | 82,950.30 | | 236,135.89 | 25,480.60 | 7,156.28 | 351,723.07 | | 7,156.28 | 279,557.41 | 65,009.38 | | 351,723.07 |
| 7. Slaughter, B. D | | 430,000.00 | 518,520.81 | 30,067.64 | 27,292.10 | 1,005,880.55 | 889.22 | 27,292.10 | 661,965.92 | 301,653.15 | 14,080.16 | 1,005,880.55 |
| 8. Blauvelt, W. F.[e] | 31,273.24 | | 657,689.79 | 24,487.36 | 21,276.54 | 735,176.93 | 3.40 | 21,726.54 | 691,847.49 | 21,599.50 | | 735,176.93 |
| 9. Carlton, Guy | 48,862.97 | 70,000.00 | 699,819.64 | 26,808.07 | 22,338.37 | 867,829.05 | | 22,338.37 | 666,815.57 | 141,055.45 | 37,619.66 | 867,829.05 |
| 10. Day, F. R | 24,119.25 | | 866,154.22 | 55,859.89 | 24,161.56 | 970,294.92 | | 24,161.56 | 769,680.30 | 158,446.39 | 18,006.67 | 970,294.92 |
| 11. Erwin, F. G | 470,879.53 | | 882,500.00 | | 1,425.71 | 1,354,805.24 | | 1,425.71 | 873,223.91 | 438,586.69 | 41,568.93 | 1,354,805.24 |
| 12. Wittenmyer, Edmund | 12,547.99 | | 683,064.49 | 23,655.52 | 21,573.98 | 740,841.98 | | 21,573.98 | 619,167.28 | 16,251.34 | 83,849.38 | 740,841.98 |
| 13. Carnahan, E. C | | | 268,025.00 | 8,579.07 | 5,825.46 | 282,429.53 | | 5,825.46 | 223,048.21 | 29,464.99 | 24,090.87 | 282,429.53 |
| 14. Moody, T. M | | | 154,314.14 | 7,823.00 | 1,824.92 | 163,962.06 | | 1,824.92 | 74,560.99 | | 87,576.15 | 163,962.06 |
| 15. McAndrew, J. W | 36,550.61 | | 787,689.66 | 29,631.61 | 17,127.89 | 870,999.77 | | 17,127.89 | 814,048.45 | 39,823.43 | | 870,999.77 |
| 16. Sigworth, J. M | 14,749.19 | 120,000.00 | 522,271.90 | 19,874.05 | 17,902.92 | 694,798.06 | 13,030.00 | 17,902.92 | 562,554.11 | 49,568.19 | 51,742.84 | 694,798.06 |
| 17. Whipple, H. S.[f] | | | 210,433.50 | 18,588.97 | 6,499.26 | 235,521.73 | .43 | 6,499.26 | 223,394.42 | 5,627.62 | | 235,521.73 |
| 18. Fenton, C. W | 73,943.63 | | 440,331.78 | 62,297.45 | 11,746.59 | 588,319.45 | | 11,746.59 | 481,050.17 | 33,076.90 | 62,445.79 | 588,319.45 |
| 19. Creary, W. F | 52,920.25 | | 535,351.04 | 23,561.40 | 13,934.93 | 625,767.62 | | 13,934.93 | 507,146.97 | 65,549.10 | 39,136.62 | 625,767.62 |
| 20. Chase, A. W | | | 398,342.01 | 36,878.83 | 13,113.90 | 448,334.74 | | 13,113.90 | 388,119.43 | 47,101.41 | | 448,334.74 |
| 21. McIntyre, T. H. R | 37,272.21 | | 724,214.90 | 37,094.81 | 23,780.37 | 822,362.29 | 43.47 | 23,780.37 | 781,362.89 | 17,175.56 | | 822,362.29 |
| 22. Spinks, M. G | 84,130.49 | | 371,524.47 | 42,717.74 | 11,963.42 | 510,336.12 | | 11,963.42 | 443,296.89 | 22,351.22 | 32,724.59 | 510,336.12 |
| 23. Dixon, H. B | | 115,000.00 | 316,080.40 | 12,643.24 | 16,391.00 | 460,114.64 | | 16,391.00 | 414,811.77 | 7,947.56 | 20,964.31 | 460,114.64 |
| 24. Moses, G. W | 69,274.08 | 165,000.00 | 303,038.20 | 15,436.07 | 20,167.27 | 572,915.62 | | 20,167.27 | 472,559.77 | 47,246.18 | 32,942.40 | 572,915.62 |
| 25. Brown, Preston | | 20,000.00 | 396,496.32 | 34,651.56 | 15,267.58 | 466,415.46 | | 15,267.58 | 383,745.86 | 58,132.19 | 9,269.83 | 466,415.46 |
| 26. Valentine, W. S | | | 95,000.00 | 6,348.82 | 1,807.63 | 103,156.45 | | 1,807.63 | 75,569.28 | | 25,779.54 | 103,156.45 |
| 27. Holden, S. J | | | 55,169.54 | 2,161.00 | 1,015.22 | 58,345.76 | | 1,015.22 | 44,955.77 | 12,374.77 | | 58,345.76 |
| *Acting paymasters.* | | | | | | | | | | | | |
| 1. Havard, Valery | | | 4.354.26 | | | 4,354.26 | | | 3,853.01 | 501.25 | | 4,354.26 |
| 2. Schuyler, W. S | 1,733.32 | | 1,906.65 | | | 3,639.97 | 321.26 | | 3,037.89 | 281.32 | | 3,639.97 |
| 3. Williams, Arthur | | | 53,884.96 | 13,110.11 | 2,984.96 | 69,980.03 | | 2,984.96 | 50,896.35 | 16,098.72 | | 69,980.03 |
| 4. Wilson, R. H | 7,746.78 | | 166.80 | 30.00 | 38.08 | 7,981.66 | | 38.08 | 4,026.00 | 3,917.58 | | 7,981.66 |
| 5. Buck, W. L | | | 50,198.86 | 16,177.60 | 880.84 | 67,257.30 | | 880.84 | 54,164.44 | | 12,212.02 | 67,257.30 |
| 6. Plummer, E. H | | | 53,450.05 | 13,672.53 | 2,128.95 | 69,251.53 | | 2,128.95 | 56,860.23 | | 10,262.35 | 69,251.53 |
| 7. Kuhn, J. E | 1,025.21 | | 6.70 | | | 1,031.91 | | | 1,031.91 | | | 1,031.91 |
| 8. Stamper, W. Y | | | 13,089.37 | | | 13,089.37 | | | | | 13,089.37 | 13,089.37 |
| 9. Morrison, J. F | 146.12 | | 375.73 | | | 521.85 | | | 375.73 | 146.12 | | 521.85 |

[a] Retired April 14, 1905.
[b] Retired September 6, 1904.
[c] Dismissed January 15, 1905.
[d] Not disbursing; assistant to Paymaster-General.
[e] Relieved April 11, 1905.
[f] Relieved April 13, 1905.

*Statement showing the balance in the hands of each disbursing officer of the Pay Department, United States Army, on the 1st of July, 1904, etc.*—Cont'd.

| Rank and name. | Balance in hands of each paymaster on June 30, 1904. | Remitted from the Treasury in the year ending June 30, 1905. | Received from other paymasters. | Received from soldiers' deposits. | Received from paymaster's collections. | Total received and to be accounted for. | Surplus funds deposited in the Treasury. | Paymaster's collections deposited in the Treasury. | Expenditures. | Transferred to other paymasters. | Balance in hands of each paymaster on June 30, 1905. | Total accounted for. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Acting paymasters*—Cont'd. | | | | | | | | | | | | |
| 10. Lynch, Charles | | | $2,636.00 | | | $2,636.00 | | | | | $2,636.00 | $2,636.00 |
| 11. Judson, W. V | $850.00 | | | | | 850.00 | $45.85 | | $804.15 | | | 850.00 |
| 12. Perkins, Frederick | 3,966.05 | | | $372.84 | $34.75 | 4,373.64 | | $34.75 | 3,365.45 | $973.44 | | 4,373.64 |
| 13. Beall, F. M. M | | | 16,098.72 | 984.00 | 170.16 | 17,252.88 | | 170.16 | 3,993.35 | 13,089.37 | | 17,252.88 |
| 14. Reichmann, Carl | 344.92 | | 2,360.92 | | | 2,705.84 | 344.92 | | 2,047.08 | 313.84 | | 2,705.84 |
| 15. Gerhardt, Charles | 14,929.75 | | 232.30 | 521.42 | 87.43 | 15,770.90 | | 87.43 | 2,206.57 | 13,476.90 | | 15,770.90 |
| 16. Giddings, Paul | | | 30,382.93 | 6,895.46 | 847.54 | 38,125.93 | | 847.54 | 32,238.52 | | 5,039.87 | 38,125.93 |
| 17. Wilson, J. B | 1,420.06 | | 1,000.00 | | 144.87 | 2,564.93 | | 144.87 | 1,267.33 | 1,152.73 | | 2,564.93 |
| *Special disbursing agents, pay department.* | | | | | | | | | | | | |
| 1. McClernand, E. J | | | 800.00 | | | 800.00 | | | 616.93 | | 183.07 | 800.00 |
| 2. Edwards, F. A | | $3,000.00 | | | | 3,000.00 | 948.01 | | 2,051.99 | | | 3,000.00 |
| 3. Beacom, J. H | | 3,000.00 | | | | 3,000.00 | 810.72 | | 2,189.28 | | | 3,000.00 |
| 4. Brewster, A. W | 18,903.72 | | 87,515.00 | 5,361.32 | 2,611.94 | 114,391.98 | 14,609.51 | 2,611.94 | 75,118.66 | | 22,051.87 | 114,391.98 |
| 5. Biddle, W. S | | 3,000.00 | | | | 3,000.00 | 1,381.50 | | 1,618.50 | | | 3,000.00 |
| 6. Harris, F. W | | 3,000.00 | | | | 3,000.00 | | | | | 3,000.00 | 3,000.00 |
| 7. Cloman, S. A | | | 1,566.04 | | | 1,566.04 | | | | | 1,566.04 | 1,566.04 |
| 8. Pershing, J. J | | | 2,000.00 | | | 2,000.00 | | | 1,989.51 | | 10.49 | 2,000.00 |
| 9. Mott, T. B | | 3,000.00 | | | | 3,000.00 | 1,642.92 | | 1,357.08 | | | 3,000.00 |
| 10. Young, Charles | | 3,000.00 | | | | 3,000.00 | 1,384.02 | | 1,615.98 | | | 3,000.00 |
| 11. Parker, Frank | | 3,000.00 | | | | 3,000.00 | | | | | 3,000.00 | 3,000.00 |
| 12. Guignard, W. S | | | 965.47 | | | 965.47 | | | | | 965.47 | 965.47 |
| 13. Hardenbergh, R. W | | 3,000.00 | | | | 3,000.00 | 2,304.68 | | 695.32 | | | 3,000.00 |
| Total | 2,989,970.22 | 32,092,937.50 | 33,562,447.54 | 1,531,019.80 | 798,481.27 | 70,974,856.33 | 1,208,094.72 | 798,481.27 | 32,436,762.00 | 33,562,447.54 | 2,969,070.80 | 70,974,856.33 |

# REPORT OF THE CHIEF OF ENGINEERS, MILITARY AFFAIRS.

To avoid duplication the report of the Chief of Engineers, Military Affairs, is printed in the report of the Chief of Engineers, Volume V.

# REPORT OF THE CHIEF OF ORDNANCE.

To avoid duplication the report of the Chief of Ordnance is printed in the report of the Chief of Ordnance, Volume IX.

# REPORT OF THE CHIEF SIGNAL OFFICER.

# REPORT OF THE CHIEF SIGNAL OFFICER.

War Department,
Office of the Chief Signal Officer,
*Washington, September 30, 1905.*

Sir: I have the honor to submit my annual report of the Signal Corps of the Army for the fiscal year ending June 30, 1905.

## SCOPE AND CONDITIONS.

The Signal Corps maintains military lines of information by telegraphy (wireless, aerial, and submarine), by telephony, by visual signaling, by ballooning, and by other collateral methods. It also devises and furnishes the electrical apparatus for the fire-control and fire-direction system of both the coast defenses and of field artillery. Incidentally it operates for commercial purposes military telegraph lines when such lines are not occupied with official business.

Except as to military aerostation, which is in an evolutionary stage, the Signal Corps is in the most efficient condition within its history. Its military telegraph lines are doing excellent service. Visual signaling has received unusual attention. Post telephone systems and rifle ranges are as fully installed as appropriations permit. Its wireless telegraph service challenges comparison. The many submarine cables are in excellent working order, except one, where expensive repair material is lacking. Its electrical fire-control system for coast defenses is deemed superior to that of any other nation.

As to readiness for campaigning, it is to be said that at an hour's notice the Signal Corps can furnish field trains capable of installing and operating buzzer, telegraph, and telephone lines to the extent of 1,000 miles, under conditions which will insure constant and reliable intercommunication between any moving troops—artillery, infantry, or cavalry.

Suitable supplementary service by visual signals is also available, and the portable wireless system is being perfected.

Special attention has been paid to the rapid development of lines of information as installed and operated in the military maneuvers of Europe during the South African contest and in the Russo-Japanese war. Careful studies of foreign methods have shown deficiencies in the American Army only in connection with the fire control and fire direction of field artillery, which deficiency, on the recommendation of the Chief Signal Officer of the Army, and with the approval of the Chief of Staff, is in process of remedy.

## ALASKAN TELEGRAPH SYSTEM.

For convenient reference, field operations are treated geographically under the headings of Alaska, the Philippines, and the United States.

This work was initiated by acts of Congress approved May 26, 1900, March 2, 1901, and June 30, 1902. In accordance with the recommendations of the Secretary of War in his annual report of 1902, Congress, by an act approved March 3, 1903, authorized the connection of Seattle by cable with southeastern Alaska, where the military posts of Skagway and Fort William H. Seward (Haines Mission) were telegraphically reached only over Canadian lines. Current results amply confirm the wisdom of the Secretary of War in this recommendation. Great benefits have resulted, both civil and military. The President and the War and Navy Departments now have direct telegraphic communication with the five military posts and the naval station in Alaska, and also with the nearest ice-free harbor in the settled portion of North America to the Asiatic coast. The military importance of the lines from a strategic standpoint is beyond question.

Commercially the system has been of very great value in conserving and fostering the business interests of Alaska, from which Territory nearly $30,000,000 worth of products have been exported to the United States during the past year. The enormously productive mining districts of southeastern Alaska, of the Tanana Valley, and of the Nome region are adequately served; most of the great fish canneries are contiguous to telegraph stations; the administration of justice is efficiently promoted; the transaction of public business greatly facilitated; the life of the Alaskan pioneer is made brighter and more civilized. As regards relief of extensive destitution the telegraph system affords information for intelligent and economical action, as is shown by its refuting false rumors, which this year duplicated the Dawson fabrication of 1898 on which $195,000 was uselessly expended.

The telegraph system, considered primarily desirable for military purposes, is to-day industrially and commercially indispensable, and through its facilities Alaskan business methods and commercial enterprises have been administered with greater advantage than ever before. The telegraph, so necessary to supplement daily mails in the United States, is immensely more important in a region where mails are entirely lacking for months at a time and are infrequent during the rest of the year. This necessity is emphatically demonstrated by an immense volume of telegraphic business, whose tariffs, exceeding $100,000 the past year, will annually approximate $200,000 in coming years.

### ADMINISTRATION.

During the greater part of the year the Alaskan system has been under the direction of Maj. W. A. Glassford, Signal Corps, at the Seattle end of the Alaskan cable, in addition to doing duty as chief signal officer Department of the Columbia. By previsionary measures and systematic methods he has materially improved the administration of the system, and is entitled to credit for its generally increased efficiency.

Brig. Gen. Constant Williams, commanding Department of the Columbia, has contributed largely to the success of the system by his hearty support and cooperation, which have been seconded by his staff.

Major Glassford's assistants were Capts. Otto A. Nesmith and Leonard D. Wildman, First Lieuts. John E. Hemphill and William C. Fitzpatrick, Signal Corps. Captain Nesmith successfully administered line work from Fort Egbert. Lieutenant Hemphill at Nome, and Lieutenant Fitzpatrick at Fort Gibbon, not only ably supervised the work of maintenance, supply, and repair, but also displayed great activity in the field, inspecting and cheering their men by long and arduous winter journeys. With rare exceptions the officers of the line in Alaska have heartily cooperated, and the Signal Corps has endeavored to ameliorate Alaskan conditions through military press bulletins and facilities for social communication.

### STATIONS AND DISTANCES.

Its totality comprises elements not elsewhere combined in a single system; submarine, land, and wireless sections are worked as a component and harmonious whole. The construction aggregates to date 4,038 miles, including not only 2,434 miles of cable and 1,497 miles of land lines, but also a wireless section of 107 miles. Two hundred and eight miles have been abandoned, 3,830 being operated. The inclosed map makes clear situations that can not be easily described:

| | Intermediate. | Total. |
|---|---|---|
| NOME-VALDEZ SECTION. | | |
| *Wireless lines.* | *Miles.* | *Miles.* |
| Safety to Fort St. Michael | 107 | 131 |
| *Land lines.* | | |
| Nome | 0 | 0 |
| Fort Davis | 4 | 4 |
| Safety | 20 | 24 |
| Fort St. Michael | 107 | 131 |
| Golsovia | 35 | 166 |
| Unalaklik | 30 | 196 |
| Old Woman | 50 | 246 |
| Kaltag | 45 | 291 |
| Nulato | 40 | 331 |
| Koyukuk | 30 | 361 |
| Grimkop | 20 | 381 |
| Louden | 30 | 411 |
| Melozi | 35 | 446 |
| Kokrines | 38 | 484 |
| Birches | 40 | 524 |
| Fort Gibbon | 55 | 579 |
| Cosna | 45 | 624 |
| Baker[a] | 25 | 649 |
| Tolovana | 37 | 686 |
| Nenana | 55 | 741 |
| Chena | 48 | 789 |
| Fairbanks | 10 | 799 |
| Salcha | 37 | 836 |
| Goodpaster[b] | 60 | 896 |
| Central | 32 | 928 |
| Summit | 58 | 986 |
| Ketchumstock | 54 | 1,040 |
| Dennison Creek | 30 | 1,070 |
| Tanana Crossing | 25 | 1,095 |
| Big Tokio | 31 | 1,126 |
| Mentasta Pass | 20 | 1,146 |
| Cheslotta | 20 | 1,166 |
| Chistochina | 26 | 1,192 |
| Talsona | 20 | 1,212 |
| Kulkana | 20 | 1,232 |
| Copper Center | 26 | 1,258 |
| Tonsina | 25 | 1,283 |
| Teikhell | 24 | 1,307 |
| Saina | 24 | 1,331 |
| Keystone | 19 | 1,350 |
| Valdez | 12 | 1,362 |
| Fort Liscum | 8 | 1,370 |

| | Intermediate. | Total. |
|---|---|---|
| FORT EGBERT BRANCH. | | |
| *Land lines.* | *Miles.* | *Miles.* |
| Ketchumstock | 0 | 1,370 |
| Gold Creek | 11 | 1,381 |
| North Fork | 19 | 1,400 |
| Champion Creek | 39 | 1,439 |
| Fort Egbert | 29 | 1,468 |
| Boundary | 11 | 1,479 |
| RAMPART BRANCH. | | |
| *Land lines.* | | |
| Rampart | 0 | 1,479 |
| Glen | 35 | 1,514 |
| Baker | 15 | 1,529 |
| SEATTLE-VALDEZ CABLE. | | |
| [Fort Lawton to Fort Liscum.] | | |
| Fort Lawton | 0 | 1,529 |
| Seattle | 3 | 1,532 |
| Sitka | 1,037 | 2,569 |
| Valdez | 601 | 3,170 |
| Fort Liscum | 4 | 3,174 |
| VALDEZ-SEWARD CABLE. | | |
| Seward | 0 | 3,174 |
| Valdez | 200 | 3,374 |
| SITKA-SKAGWAY CABLE. | | |
| Sitka | 0 | 3,374 |
| Juneau | 291 | 3,665 |
| Fort W. H. Seward (Haines Mission) | 102 | 3,767 |
| Skagway | 21 | 3,788 |
| LAWTON-WORDEN BRANCH CABLE. | | |
| [Spare cable.] | | |
| Fort Lawton | 0 | 3,788 |
| Fort Worden | 42 | 3,830 |

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[a] Under orders to remove to Hot Springs.

[b] Burned. To be reconstructed at McCarthy, Big Delta, and Delta station added at Little Delta River.

### OPERATION OF ALASKAN CABLES.

The submarine cables of southeastern Alaska, 2,300 miles in length, have been maintained and operated with entire success.

Ignoring the work of the commissioned officers, it is to be said that the enlisted men of the Signal Corps on cable duty have illustrated anew the ability, intelligence, and resourcefulness of the American soldier. Without exception every cable message has been transmitted and received by selected enlisted men, who qualified themselves for this difficult technical work with a rapidity and skill that were most gratifying. There is now in the Signal Corps a force of about 30 men so skilled in splicing, testing, and operating submarine cables that to-day the Signal Corps of the Army is competent to operate any submarine cable under war emergencies.

The military importance of these conditions is evident from the fact that no other army in the world has a similarly trained cable force. Experiences of late wars indicate the great tactical value of cable service. Of it Colonel May, in Imperial Defense, says:

> Early intelligence in naval warfare is as valuable as a reenforcement of many ships. Rapid cable laying in time of war is a problem of imperial defense of the first importance.

As previously stated, the initiation of the Alaskan cable was planned and executed with great haste, the immediate establishment of an all-American route to Alaska being deemed of wise prevision. This involved the necessity of laying a deep-sea cable over an unsurveyed ocean bed near to and parallel with a rocky and precipitous coast, an unprecedented action in cable operations which under less urgent conditions would not have been favored by the Chief Signal Officer of the Army.

It develops that these gradients of ocean depths are most abrupt, instead of being gradual, as was indicated by existent soundings. In latitude 54° 03′ north, longitude 134° 10′ west, where by interpolation from adjacent soundings a depth of 1,519 fathoms was expected, there was later found a depth of only 807 fathoms, the cable having been laid over a submarine mountain of 4,200 feet. Similarly in latitude 59° 23′ north, longitude 142° 27′ west, in removing a cable fault there was found a depth of 1,027 fathoms as against 700 by the latest charts. The maximum depth is 1,600 fathoms.

Despite these untoward physical conditions there has been but one interruption in the Seattle-Sitka section of 1,037 miles, and one upon the Sitka-Valdez cable of 601 miles. Neither interruption was due to any fault in construction or installation, but to mechanical injuries. The first cable was damaged probably by an anchor in the bay near Fort Lawton, and the latter by the enmeshment of a large humpback whale (*Megaptera-nodosa*), which was found dead and entangled in the Valdez cable when repairs were made at the mouth of Sitka Harbor.

As stated in my last report, the Norton Sound cable from Nome to St. Michael was so seriously damaged by heavy ice during successive winters as to demonstrate the impracticability of successful cable operations, except at great expense and by a modified route. Its replacement by a most satisfactory wireless system caused the Chief Signal Officer of the Army to recover such portions of the cable as are not destroyed, with a view to their utilization elsewhere. Ten miles only were recovered, found in the original position; the remainder had disappeared. Such disappearance can not be satisfactorily attributed to ice conditions, as indications point to extraneous methods of removal.

### VALDEZ-SEWARD CABLE.

On April 23, 1904, Congress appropriated the sum of $321,580 for the completion of an all-American telegraph route to Alaska, supplementing the Seattle-Skagway cable by one from Sitka to Fort Liscum (Valdez). By the act approved March 2, 1905, Congress further appropriated the sum of $95,000 for the extension of the submarine cable from Valdez to Seward at the head of Resurrection Bay, the southern terminus of the Alaskan Central Railway.

In connecting Valdez with Seward, the Chief Signal Officer of the Army adhered to his previous policy of installing a seamless rubber cable of American manufacture, to be operated by American soldiers, and to be laid by an American ship. By this policy not only have the economical interests of the United States been subserved, but there are now available in the American Army instruments, equipment, and personnel competent to install, operate, repair, or disable submarine cables of any length, in depths not exceeding 2,000 fathoms.

The act of March 2, 1905, made the appropriation for the Valdez-Seward cable immediately available. The short Alaskan season necessitated speedy action to insure the installation of this cable during 1905. The character of the ocean bed between Seward and Valdez was unknown, and must necessarily be roughly determined by a running survey.

Public proposals were at once invited, and the results illustrate American ability and resourcefulness in a new field, four American corporations bidding for the work. The award was made March 17, 1905, to the Safety Insulated Wire and Cable Company, of New York City, who completed by May 23, 1905, the entire cable—223 miles of deep-sea, intermediate, and shore-end types. It was transported by rail from Bayonne, N. J., to Seattle in twenty-four days. Its transfer to the cable tanks of the U. S. transport *Burnside*, assigned to duty as a cable ship, was made with great care under the supervision of Capt. Charles S. Wallace and Cable Engineer Henry Winter, the work being done by a trained Filipino cable crew. The *Burnside*, delayed at Seattle from causes not within control of this Bureau, reached Valdez and commenced operations on July 31. By August 3 the cable was laid to Seward without accident or interruption. The elapsed time from the approval of the appropriation bill to the cable reaching Seward was five months, which in case of necessity could have been materially reduced.

### CABLE EXTENSIONS.

From a military standpoint it is not clear that there should be further extensions, unless Ketchikan be deemed strategically important from the conjoined facts of its proximity to Port Simpson, the projected terminus of the new transcontinental Canadian railway, and its position as the official port of entry to southeastern Alaska. Naturally, if a naval station is located on the Aleutian Islands it should be connected with the Alaskan system either by cable from Seward or by wireless from Nome, via a relay station on Nunivak Island.

It is suggested, also, as a relief to the National Treasury, that the line receipts from the Alaskan system be spent in a manner similar to the taxes for Alaskan roads. Such legislative action is recommended, with a provision that extensions shall be made on the approval of the President and be reported annually to Congress. The Alaskan pioneers are now paying Government telegraph tariffs at the rate of more than $100,000 annually, and such legislation appears to be equitable to them.

### CABLE REPAIRS.

To insure suitable personnel, machinery and reserve cable for serious interruptions which might occur when Congress is not in session, an appropriation of $50,000, available until expended, was made by the act of March 2, 1905, for the repair of military deep-sea cables, either for Alaska or the Philippines. No portion of this money has yet been spent, but a duplicate set of cable machinery will soon be purchased and a suitable tank built for storage of surplus Alaskan cable.

The installation and repairs of the Alaskan cables have been made by the U. S. transport *Burnside*, fitted up as a cable ship. While of somewhat defective construction for such purposes, yet she has been thoroughly equipped with modern cable machinery, testing room, etc., and under command of Capt. Charles S. Wallace, Signal Corps, has most satisfactorily performed her work in Alaskan waters. It is of the utmost importance that she should not be detached from this duty, which, with the care of the submarine cables for coast defenses in Puget Sound, imperatively and constantly demands a stanch and well-fitted seagoing boat. Strangely enough, the most difficult cable work done by the *Burnside* was the installation of the coast-defense cables between Forts Casey, Flagler, and Worden. The *Burnside* should be laid up in Puget Sound, naturally with a reduced personnel, ready for sailing orders in an emergency.

The following extract from the annual report of Maj. W. A. Glassford, in charge of the Alaskan telegraph system, shows the necessity of such action:

> Cable interruptions through various causes are invariably to be anticipated, therefore suitable provisionary means for quick transport to the point of trouble, carrying the necessary force, repair material, machinery, and grapnels to raise the cable to the surface from the deep-sea floor upon which it lies, must always be in readiness.
>
> The cable ship *Burnside* is at present equipped for this purpose, with rendezvous at Seattle. So important has the commercial business become between Seattle and Alaska (averaging more than $10,000 per month) that any long interruption of the cable becomes almost an industrial catastrophe, hence there is an absolute necessity for this cable ship to be at some calling point between the terminals of the cable of Resurrection Bay and Puget Sound. The usefulness of having the *Burnside* within calling distance is illustrated by the interruption which occurred last May in Puget Sound; the *Buruside*, then just running into Sitka, proceeded south at once and the cable was restored to operation within four working days of its interruption.

### LAND LINES.

The construction of the Alaskan land lines, 1,422 miles in length, was an undertaking of extreme difficulty, owing to the uninhabited districts, almost inaccessibility, difficult transportation, remoteness from centers of industry, and particularly from the absence of roads or trails. Even to-day there are more than 1,300 miles of line through a country where no wheeled conveyance can travel in summer.

The maintenance of the line taxes to a greater extent the resources of the Army than did its original construction, for the latter was by large parties and the former is by individuals. Every one familiar with the Alaskan country back from its rivers expresses surprise at both construction and maintenance.

### LINE INTERRUPTIONS.

The conditions considered, the continuity and reliability of the service has been beyond expectation, the interruptions between Valdez and Nome, the extremes of the line, being 40.7 days, 1 day in 9, and between Valdez and Fairbanks (the great Tanana center) only 17.7 days, or 1 day in 20. Half of the interruptions occurred in June, owing to forest fires in the upper Tanana, and unprecedented flood conditions in the lower valley.

This unusually efficient service is the result of devoted field work by the Signal Corps, assisted by men of the line. The duty involved much winter travel and field service of an arduous character, in which Lieutenants Hemphill and Fitzpatrick have shared.

On this subject Major Glassford says:

> The interruptions during the winter were reduced to about one-half of those of previous years, due to the energy and zeal of the repair men who patrolled the line on their section. Extreme suffering was experienced by repair men during severe storms, and in one instance a break on the Yukon forced the repair parties to leave their stations, when soft, deep snow, which made traveling slow by snowshoes, in some cases prevented the men from reaching relief cabins and forced them to seek shelter in thickly wooded places where fires could be made.
>
> In view of the fact that through persistent betterments there has been so considerable a time of uninterrupted communication between the United States and the great mining centers of Alaska, and also from the fact that this same telegraph line has stimulated these mining industries to a point not before thought of, it has become the duty of the Government to correct the line to such an extent that frequent and prolonged interruptions may not be reasonably anticipated.
>
> The interests involved, which may be said to be measured by the line receipts amounting to about $10,000 per month, seem to permit a slighting of this consideration.

### TELEGRAPH RESERVATIONS.

The establishment of telegraph stations has affected the status of miners and other settlers entering Alaska, especially in the valleys of the Tanana and of the Copper River. In a number of instances squatters have built undesirable establishments near to telegraph cabins, and others, when in legitimate pursuits, have attempted to prevent the Signal Corps from obtaining from contiguous land fuel or telegraph poles for necessary repairs. This was certain to be followed by objections to the felling of timber for a telegraph right of way.

To forestall trouble and protect the interests of the United States, the Chief Signal Officer of the Army recommended that there be withdrawn from settlement a telegraph right of way, 100 feet wide, along the military lines from Valdez to Fort Egbert, from Fort Egbert to Boundary, from North Fork to Fort Gibbon, from Baker to Rampart, from Fort Gibbon to St. Michael, from Safety Harbor to Fort Davis, and in addition that small reservations be declared for the telegraph offices, store houses, and stables at repair stations in Alaska. This action was approved, as announced in General Orders, No. 83, June 5, 1905, the President of the United States having set apart, by order dated May 24, 1905, these reservations for the use and maintenance of military lines in Alaska, subject to private rights.

A lease of a portion of the reservation at Chena, which was considered necessary for use of the Tanana Mines Railway Company to reach suitable deep water, was made by the Secretary of War, on the recommendation of the Chief Signal Officer of the Army, for a term of years at a rental of $100, payable annually to the United States.

### REPAIRS AND REPAIR STATIONS.

Of the 47 stations on land lines only 10 are maintained (5 at military posts and 5 at important towns) for military or commercial purposes, the remaining 37 being for repair purposes. These stations, averaging about 40 miles apart, were originally manned by one signal corps man with two assistants from the line of the Army, experience having demonstrated the extreme danger of sending a repair man alone through an uninhabited country in stormy or wintry weather. Each detachment is provided for a year in advance by supplies sledded in in midwinter, this work usually beginning in November and continuing until March. With occasional blizzards and very heavy snowfalls, and temperatures as low as 60° below zero, winter service is of the most dangerous and trying character. The soldier's life is not only thus arduous, but extremely monotonous owing to the isolation from the world, months sometimes passing without even the face of a native being seen.

The relief of the Eighth Infantry by the Third Infantry in 1904 resulted, through misunderstandings, in the practical abandonment of half of the repair stations by the line of the Army, greatly increasing the labor and dangers of the inadequate force of the Signal Corps. Proper representations have been made regarding this subject to Gen. Constant Williams, commanding the Department of the Columbia, who promptly issued orders that the line of the Army should in the future bear its part of these burdens equally with the Signal Corps.

The repair work of the enlisted men, whether of the line or of the Signal Corps, is an arduous and dangerous duty, which has been performed in almost every case with fidelity and in many cases under conditions akin to heroism.

On this subject Maj. W. A. Glassford reports:

> Master Signal Electrician Bauer, Sergeant Kyttle, Corporal Herb, Privates Beloat and Cavanaugh performed exceptional service on the line during January. Privates Ferris and Shoemaker, Third Infantry, should be mentioned for their work in removing trees from the line for a distance of 37 miles and putting a section of the line in order in the midst of a blizzard.
>
> Practically all the men serving in Alaska deserve mention for their services under the severe conditions it imposes, contributing by the performance of hard-earned work to the credit of the service. Any list would be incomplete without the roll of all the men in Alaska whose services under the circumstances entitle them to the gratitude belonging to the faithful soldier.

It should be added that First Lieuts. John E. Hemphill and William C. Fitzpatrick, Signal Corps, have shared the hardships and fortunes of the enlisted men in the field during the past winter with creditable fortitude and unflinching determination. Unfortunately, Lieutenant Fitzpatrick's health was undermined by his work in the field, necessitating his summary relief and transfer to the general hospital at Fort Bayard, N. Mex.

Fortunately, through precautions taken, the enlisted men have, save in one instance, served without casualty on repair duty during the year, although in many instances men were in danger more or less imminent. The casualty referred to occurred at Old Woman station at the base of a precipitous mountain, where Private Watson, Company G, Seventh Infantry, lost his life through being caught in a snowslide. As there was constant danger during the winter months of the entire detachment being crushed in like manner, a new cabin has been built some distance from the old site.

### CONDITION OF THE ENLISTED MEN.

During the past year a special report of a line officer dwelt on the unsuitability of the quarters, clothing, food, etc., of the detached enlisted men. Suggestions for improvement were promptly carried out as far as practicable, but in order to cover the important matter of suitable care of the men, the Chief Signal Officer of the Army inspected the Alaskan system during the past summer, visiting personally 24 stations, principally in the valleys of the Tanana and the Yukon.

He was thus able to pass intelligently upon all matters pertaining to the proper care of the enlisted men serving at detached stations. It is pleasant to report that he has had the fullest cooperation in remedying defects found, not only on the part of Brig. Gen. Constant Williams, commanding the Department of the Columbia, and his staff, but also from the Secretary of War, the Acting Chief of Staff, and bureau chiefs.

The most defective of the buildings, such as those at St. Michael, Safety Harbor, Koyukuk, Nulato, Birches, Baker, Cosna, and Goodpaster, are in process of repair or reconstruction, the sites being changed in some instances. It is probable that the sum of $15,000 if judiciously spent another year will amply provide for all other stations.

The Surgeon-General of the Army has arranged for a small medical box at each detached station; the Chief of Ordnance has provided shotguns, with ammunition, for use in securing game; and the Quartermaster-General ordered suitable special supplies.

The question of food is a very difficult one to correct, beyond furnishing shotguns for game, as has already been done. One station is said to have been eleven months without fresh meat, and but very few of the 37 repair stations can be provided with fresh meat at any season of the year, although it is furnished seven days out of ten to men serving at Alaskan military posts.

To offset fresh meat there had been previously authorized a small extra allowance of butter, milk, and sirup to men when serving in detachments of two. This, however, was a practical denial to the whole force, since safety demanded three men at a station. On the urgent telegraphic representations of the Chief Signal Officer of the Army, pointing out that at least one man was suffering from scurvy, the extra allowance of butter, milk, and sirup was authorized this autumn to three men serving together, but unfortunately denied to four men.

It is to be regretted that sufficient officers are not available for the annual inspection of all telegraph stations in Alaska, there being about 600 miles of line which has not been visited by any officer of the Signal Corps for the past two years; but there is a limit to the amount of work which any single officer can do.

### RECONSTRUCTION.

The serious illness of the officer in charge of the Yukon and Tanana districts, and the prolonged interruptions in these sections, made it advisable for the Chief Signal Officer of the Army to extend his personal inspection of the system to the Tanana Valley. While the presence of an experienced officer would have perhaps sooner restored communication over this section, it is unquestioned that prolonged interruptions must have resulted from the extensive forest fires in the upper Tanana watershed and unprecedented floods in the lower valley which washed away repair cabins and occasionally portions of the telegraph line.

The process of replacing a few telegraph poles is easy in the United States, but in remote districts of Alaska, without inhabitants, without trails, and without transportation save by water, the task of replacing a mile of line is extremely difficult. The two repairmen carry not only their repair tools, but also their tentage, bedding, food, and cooking utensils. After poles are cut they must be carried on their shoulders through dense thickets, and heavy coils of wire must be dragged or rolled through a pathless region.

The subject of preventive repairs was thoroughly and personally investigated by the Chief Signal Officer of the Army, who has taken such steps as will greatly mitigate and almost entirely remove interruptions another summer. Strangely enough the summer is the most difficult time for repairs and maintenance.

The condition of affairs in the upper Tanana has been gradually improved by general repairs from Ketchumstock to Goodpaster. As Goodpaster station was burned, it was found to be in the public interests to remove to McCarthy station, at Big Delta River, on the south side of the Tanana, where the mail route, the miners' trail, and the work of the Alaskan road commission meet, thus making the cooperation of the Signal Corps most advisable in the general interests.

An additional station has been ordered built at Little Delta, on the south side of the Tanana, for permanent occupation, and arrangements made to open annually three temporary summer repair stations near Tolavana, Nenanà, and Hot Springs, which will make the longest summer repair section 28 miles.

The summer conditions of the lower Tanana make the efficient maintenance of the line from Baker to Fort Gibbon impossible save in very favorable years. This line is therefore to be abandoned, Baker being removed a few miles to Hot Springs. The old, temporary, and abandoned line from Rampart to Gibbon is to be rebuilt along the Yukon. The placing of this section on high ground, through a somewhat settled country, as against a trackless, uninhabited region must materially improve the summer service. These changes are in process of completion.

### WIRELESS SECTION.

In August, 1903, a wireless section of 107 miles across Norton Sound was established through the professional skill and exceptional ability of Capt. Leonard D. Wildman, Signal Corps. This is the only long wireless telegraph system in the world, it is believed, that is regularly operated as a part of a telegraph system handling commercial business. On August 6, 1904, it completed a year of uninterrupted service over its course of 107 miles. It has handled daily and uninterruptedly the entire telegraphic business of Nome and the Seward Peninsula, which, together with the official business, averages several thousand words daily. More than a million words were sent during the year, many thousand being commercial code words in which no error has ever been traced to this section. In a single hour there have been transmitted over this section 2,000 words without error or repetition. The successful installation and operation of this unique work by the officers and soldiers of the American Army afford an added illustration of their intelligence and aptitude.

Captain Wildman, at his own request, was retained at Nome throughout an arctic winter, so as to insure continuity of operation and the successful training of the enlisted force. This action was fortunate, as an unexpected destruction of Leyden jars threatened the interruption of the line, but the situation was saved by Captain Wildman's resourcefulness in construction and substituting air condensers. In addition to his ingenuity in original installation, Captain Wildman has invented a new receiver, which is simple, inexpensive, and efficient.

Of this service Major Glassford says:

> Captain Wildman remained in charge of the wireless installations, and through his technical ability, energy, and resourcefulness, and ably assisted by the enlisted men of the Signal Corps under him, each of whom took a personal interest and pride in his work, the wireless system in operation between St. Michael and Safety Harbor has the proud distinction of over (now thirteen) ten months of continuous uninterrupted service.
>
> Of the work of the enlisted men at these stations Captain Wildman has practiced making the men rely upon themselves for all minor defects, and to call upon him only when they had exhausted their own resources. In but two cases has he been called upon to suggest remedies. This is a remarkable instance of the ingenuity and adaptability of the better class of men in the Signal Corps. Captain Wildman frankly admits that in several instances their way of making repairs was better than his original way of designing the parts, and also acknowledges his indebtedness to every man in the two plants for suggestions. Two large commercial companies doing business in that section state that since the wireless has been established not a single code word in their messages has been incorrectly received.

The wireless work was done by an alternate current, 500 volts, 60 cycle, 3 kilowatt generator; a 6-horsepower gasoline, single cylinder engine, with special governor; a small grid at masthead with only two connecting wires, and large ground capacity.

The dynamos, built according to Wildman's plans, were provided with specially heavy insulation about the armature coils and collector rings. The switchboards were of home manufacture.

Electric storms gave little trouble, and weather or ice conditions had no material influence. The receiver was of the De Forest type, modified by signal corps inventions. Captain Wildman found many opportunities for the resourceful minds of himself and his subordinates. Broken Leyden jars were successfully replaced by air condensers, the spark was muffled, currents shunted, and many other improvements applied. Captain Wildman thinks duplexing possible to a certain extent, and a call-up device probable. The efficiency of the service is largely attributed by him to the ingenuity and resourcefulness of his subordinates, Sergeants Harper, Munroe, Treffinger, Wilson, and McKinney being especially commended. The last named devised a key that increased the sending capacity from 15 to 30 words per minute.

At St. Michael water was only obtainable from melted ice for nine months of the year, but at Safety a well sunk in the house furnished brackish water for operation.

The engines, dynamos, and other important apparatus were duplicated, owing to the fact that Nome is accessible but three months each year. Of this precaution Captain Wildman says:

> The wisdom of this duplication is shown by the fact that, during the nine months of operation completed this day, not a single hour has been lost from any cause whatever. If, however, two engines had not been available, there would have been

three occasions when a delay of from twenty-four to forty-eight hours would have been unavoidable.

The first accident occurred on January 25, when a part of the roof of the engine house was blown off, filling the room with snow and putting out the fire in the stove. The water jacket surrounding the cylinder froze before it could be emptied, and cracked the cylinder. This occurred at 4 o'clock in the morning while the men were asleep, and at 9 o'clock that morning, at the usual hour for opening the office, a temporary roof had been constructed, the snow drifts cleaned out, the dynamos dried, and the spare engine connected up.

The second accident occurred in February, when the belt broke during the sending hour, ripping out all the pipe connections and putting the engine out of line. The other engine was started within two minutes and the service was not interrupted.

The third accident occurred in March, and was caused by cracking the spark plug. While this would have necessitated shutting down for only an hour, that short delay was avoided by the fact that the other engine was in readiness.

The astonishing success of this system is due to the ingenuity, application, and prevision of Capt. L. D. Wildman, Signal Corps. While his preliminary experimental work in Long Island Sound, mentioned in last year's report, forecast success in Alaska, it is possible that the system would have broken down from minor causes had he not voluntarily urged, to his personal discomfort, the necessity of his remaining in Alaska for the winter instead of returning to San Francisco, as his orders required.

Captain Wildman's report is full of valuable data bearing on the work at St. Michael in particular and on wireless telegraphy in general.

Observation and experiments made by Captain Wildman indicate the impracticability, in the present stage of wireless telegraphy, of the suggested plan of connecting St. Michael and Valdes by three intervening wireless stations. This also tends to the opinion long since advanced by the Chief Signal Officer of the Army on limitations of wireless systems apart from the element of distance alone.

### TELEGRAPH RATES.

During the year the tariffs for Alaskan messages have been subject to criticism and subjected to a thorough examination and consideration. The questions considered were technical and complicated, involving cable systems, land lines, wireless sections, and enormous distances of intervening uninhabited areas between paying stations.

A thorough examination of the subject led to a confirmation by the President of the tariffs fixed by the Chief Signal Officer of the Army. The tariffs over the cables were far lower than obtained elsewhere in the world over lines similarly situated, and the land rates were about one-fifth of those obtaining on the 500 miles of commercial lines, telegraph and telephone, in Alaska. At 7 stations, handling 90 per cent of the Alaskan business, the charges on messages handled via Canadian lines were 143 per cent greater in 1904 than those fixed by the Chief Signal Officer of the Army for messages transmitted over the Signal Corps cable.

The prospect that tariffs approximating $80,000 per annum would be deposited in the Treasury of the United States gave the impression that the cable was being made a paying investment, when, as a matter of fact, the cost of operation and maintenance is, and probably will be for years, greater than the receipts. Reductions will be made from time to time as business increases and conditions demand.

With a view, however, of serving to the greatest possible extent the interests of the Territory and to bring Alaskan daily life more in contact with national affairs, the Chief Signal Officer of the Army reduced the press rates to a nominal figure, as follows: To southeastern Alaska, 1½ cents per word; to Copper River country, 2 cents per word; to Tanana and Yukon valleys, 2½ cents per word, and to the Nome region, 3 cents per word.

It is interesting to note that under this liberal treatment the important news of the United States, and indeed of the world, conveyed from Seattle by cable, reaches Nome as a wireless message sometimes at 6 p. m., owing to six hours' advantage in time to the westward.

To stimulate domestic messages, a rate was fixed transmitting messages on domestic affairs between any two land stations in Alaska at a tariff of 50 cents per 10 words or $1 for 25 words. The same tariff applies to domestic messages handled by wire to Valdes, and thence in and out of Alaska by mail. Several hundred domestic messages have thus been handled, and an increase is expected.

### ALASKAN TELEGRAPH BUSINESS.

During the year there were handled 134,630 messages. The pecuniary value of telegraphic work of the Signal Corps in Alaska is indicated by the tariffs on the messages handled, which, if paid for at commercial rates, would aggregate the sum of $175,488.29, divided as follows: Official messages sent by different Departments of the United States Governments, $71,349.28; commercial messages, $104,139.01.

All official business of the various Departments of the National Government is, however, transmitted free. The tariffs on the commercial messages are divided as follows: "This line" receipts, which have been deposited in the Treasury of the United States, as the law requires, $78,015.44; "Other line" receipts, being the tariffs pertaining to the transmission of messages over commercial lines, which have been transferred to the officials of the commercial telegraph lines to which they belong, namely, the Canadian government system, the White Pass and Yukon Railway Company, the Postal Telegraph-Cable Company, and the Western Union Telegraph Company, $26,123.

In addition to this there has been excluded from this circulation all official messages relating to the Signal Corps, and a very large amount of free business, on which the tariffs, if calculated, would exceed $90,000. The free business consists of military news bulletins, notifications regarding the progress and interruption of mails, the transmission of river reports, weather data, and other like information.

It was deemed proper to relieve the isolation of Alaskan life by furnishing daily the approved news bulletin to each military post and station, and by granting a strictly limited use of the line in intercommunication on social subjects between the different military stations.

It is estimated that the value of the tariffs for the coming year will be about as follows: Other lines, $40,000; this line, $110,000; official business, $100,000; in all, about $250,000, of which $150,000 will be in cash and the other the value of Government business.

It is renewed evidence of the high character of the enlisted men of the Signal Corps that although most of the men in Alaska handle money received for telegraph tariffs, there was during the year but one case in which a shortage was reported, and in this the entire amount was recovered. To include July 1, 1905, nearly $200,000 has been received and accounted for by the enlisted men of the Corps and not a single dollar has been lost to the United States. That the amounts handled are neither unimportant nor inconsiderable is shown by the fact that in a single year one sergeant received and accounted for $10,237.58.

### LAND LINES EXTENSION.

No extension of land lines seems necessary. The needs of the Tanana mining camps near Fairbanks are met by a local telephone service of 75 miles and 120 stations, built and maintained by private enterprise.

### FUTURE DISPOSITIONS.

The Chief Signal Officer of the Army recommends for the Alaskan telegraph system the policy of gradual abandonment of the land lines as the future development of Alaska and the coincident extension of private enterprises may render possible. At present no private corporation could efficiently maintain and operate the land lines. They are maintained by men receiving from $13 to $54, with rations, in a country where day laborers earn from $4.50 to $10 per day (in some cases with board) and skilled laborers from $10 to $15 per day. Only loyalty to his oath of enlistment keeps the American soldier on this arduous, dangerous, and monotonous duty.

Civilians hired by the Signal Corps in Alaska abandon their contracts the moment more profitable service is offered, and desert in crowds when gold strikes are reported.

The sale or transfer of the line must inevitably be accompanied by higher tariffs, but the policy of abandonment and transfer is thought to be in the best interests of the Government.

The very extensive interests of Seward Peninsula, in the Nome region, are efficiently served by a telephone service 416 miles in length and having about 200 phones, which is most efficient in operation and reliability.

If the mining interests of the upper Koyukuk should very materially improve there might be a local demand for a telephone or telegraph line from Rampart to Bettles, but such necessity does not now exist.

### DIVISION OF THE PHILIPPINES.

The military system of land lines and cables in the Division of the Philippines has been in charge for the greater part of the year of Lieut. Col. R. E. Thompson, Signal Corps, who, in addition to this work, has performed the other duties of chief signal officer, Philippines Division. The system has remained substantially unchanged during the year. One hundred and fifty miles of land lines were transferred to the civil government, 38 miles of new lines were constructed, and 332 miles reconstructed. Four very short cables, aggregating less than 15 miles, were abandoned during the year; and one new cable laid, 17 miles long, across Lake Lanao, connecting Camps Overton and Keithley.

On June 30 the military system consisted of 3,195.5 miles of line, of which 1,405.75 miles were land lines, 1,451.8 miles were submarine cable, and 337.9 miles were telephone lines. The Philippine civil government has a system of 4,774.7 miles, of which 2,266.75 miles are land lines, 2,338.75 miles telephone lines, and 169.22 miles cables. The total mileage, military and civil, is 7,970.2.

There were handled by the military lines during the year 1,033,840 messages, a falling off of 11 per cent from 1904, due largely to cable interruptions, which, through lack of a cable steamer for repairs, entailed the use of the expensive Eastern Extension lines.

The tariff values for the year aggregated $475,164.60, as follows: United States messages, $272,136.51; telegraph business of the Philippine government, $142,989.31; commercial tolls, $60,038.78. In addition, the tariffs at 10 cents per message on the official dispatches sent over the Manila military telephone system would equal $37,239 additional, making an aggreggate of $512,403.60. The land lines have been maintained in very efficient condition, and reconstruction is largely on iron poles. The army operates 82 telegraph and 11 telephone stations, while the insular government has 86 telegraph and 214 telephone stations.

Apart from the Manila telephone system there have been operated at military posts 27 telephone systems, 124.4 miles in length, having 268 telephones.

The following telegraph lines were transferred to the civil government: Cagayan to beach, 3 miles; Boac to beach, 7 miles; Manila to Dugupan, line No. 10, 150 miles; in all, 160 miles. The estimated value of the lines was $6,423.50, while signal corps property was transferred to the value of $2,402.65. It should be said that these lines, arbitrarily valued as above, would not be worth to the United States the cost of their recovery.

The operating force on June 30 consisted of 10 officers and 367 enlisted men (three companies) of the Signal Corps, and 181 civilian employees, of whom 177 general laborers, repair men, and messengers, of very small salary, were paid from the civil funds allotted by the Philippine government.

The plan of relieving the Signal Corps by companies after service of two years has been perfected, the third and last company being now under orders. A company sails each eight months, thus insuring constantly an experienced force of two-thirds. Only one man died of disease, a second died at Honolulu en route to Manila, and two men were accidentally drowned. There were no desertions.

The chief signal officer of the division making no remarks or recommendations regarding the force or work, they are assumed to be satisfactory to the commanding general.

The following pertinent extracts are from subordinate reports:

Lieutenant Beacham, in charge of the Manila telephone station, says:

> The Manila telephone system consists of three exchanges—the military central, operated day and night; the division and quartermaster's subexchanges, operated eight and one-half hours daily. Over the 190 telephones there have been 372,394 calls.
>
> It is a thorough up-to-date system of 219 miles, 66 per cent consisting of modern aerial cables.
>
> This system, which occupies 26 men, should be replaced by a civil system.

The chief signal officer believes that the installation of an efficient civil telephone service, from which instruments could be rented by the Army, would be in the economical interests of both the civil and military establishments.

## RECONSTRUCTION AND REPAIRS.

Capt. H. W. Stamford, chief signal officer, Department of Luzon, reports:

> Reconstruction of the two lines running south from Santo Tomas, province of Batangas, to Guinayangan, province of Tayabas, has been continued. This work

consisted of thoroughly rebuilding the line with iron telegraph poles, excepting in certain mountainous sections, where it was physically impossible, owing to the topography of the country, to transport this class of material, the roads and trails being in such bad condition that it necessarily made the work most difficult. However, it was successfully carried to completion under the supervision of First Lieut. Joseph W. Beacham, jr., Signal Corps.

Captain Carr, chief signal officer, Department of the Visayas, says:

> The few and brief interruptions of communication bear testimony to the care and faithfulness with which the enlisted men of the Signal Corps and the native linemen performed their arduous and at times dangerous duties.
>
> When it is understood that until within the past few months enlisted men of the Signal Corps on duty as linemen were required to cover their districts afoot in terrific heats and torrential rains, the hardships of their work may be better appreciated. The district sergeant at Jaro, charged with the maintenance of 62 miles of line, was obliged to walk this distance.

Of conditions in Mindanao, Major Greene reports as follows:

> The land line from Tucuran to Lintogoup, 20 miles long, was formerly so difficult of travel that a lineman after making the round trip was a fit subject for hospital treatment. Lieut. O. B. Grimm, Signal Corps, built several bridges and cleared out the line, which greatly reduces labor and hardships.

While malicious interference and attacks on linemen have very materially lessened, yet Major Greene says that—

> Intentional damage to the lines by hostiles and malcontents has occurred several times, noticeably on August 19, 1904, when the line was cut by hostiles near Reina Regente, and 2 Moro linemen engaged in reconstruction killed by the hostiles.
>
> Line cutting near Cudarangan became frequent, until on December 22 the lineman's escort of 20 men ran into a line-cutting party and killed 4 of them, after which trouble was much less frequent.

That conditions are not always quiet in Mindanao, Major Greene shows:

> In the Rio Grande Valley and between Malabang and Camp Vicars, as a general rule, native Moro linemen can patrol the line alone in safety, being turned back when American linemen, unless under strong escort, would be attacked.

### PHILIPPINE CABLE SYSTEM.

The military cable system in the Philippine Archipelago was initiated under war conditions, the cables being of the lightest type possible, and originally planned to last only five years. They were laid largely in unsurveyed waters and over coral beds, which the necessities of the case and the lack of funds required. Despite these facts the system has proved more efficient that was thought possible. There are now 34 cables in operation, including those of the civil government.

The interruptions to military cables have been about one for every three years of cable life in the less favorable environment of the army cables, as against one for every four years in the Eastern Extension system. It appears that a large percentage of interruptions have occurred in the shallow waters of Mindanao and the Sulu Archipelago, where the unfavorable coral bottoms can not possibly be avoided in whole, although they could in part. On this point Major Greene pertinently says:

> Some causes of disaster may be removed by extended soundings and relocations of new cables in deeper water, but others can not be avoided; the approaches to the landings for long distances being over coral, which, with the action of the tides, acts as an ever present and working file.

Despite the insistence of the Chief Signal Officer of the Army, and the directions of the Secretary of War that the cable system should be maintained efficiently, the Signal Corps was without proper transportation during almost the entire year for deep-sea operations. It was also officially reported that seventeen days elapsed before transportation was furnished to repair a lake cable.

It was not until April, 1905, that a cable ship, the *Liscum*, was provided for signal-corps work. Under the direction of First Lieut. James S. Butler, Signal Corps, in charge of the *Liscum*, such efficient work was done as has restored every signal-corps cable except that between Jolo and Zamboanga, for which cable material is lacking. The cost of the *Liscum* is about $13,500 per month, while she is still available to carry passengers and freight.

If efficient cable service is to be maintained in the Philippines the *Liscum* must be kept available as a cable ship, and considerable money spent each year in the purchase of new cables.

### ENLISTED MEN.

The same qualities of ability, fidelity, and courage which have marked the service of the enlisted men in the Philippines during previous years have been continued. Their physical wants are being better guarded than in previous years, and changes of station relieve the monotony of life at certain stations.

The most striking service by a signal corps man during the year was doubtless that of Corpl. Edwin Myers, of which Major Greene says:

> On May 11, 1905, at 1 a. m., at Siasi, which is garrisoned by a company of Moro constabulary, a sentry murdered the commanding officer while asleep. The signal-corps operator, Corpl. Edwin Myers, at once assumed command of the company and held them for twenty-four hours until the arrival of an officer. He probably saved the command from going to pieces.

This service was recognized by the Chief Signal Officer of the Army in an order promoting Corporal Myers to the position of first-class sergeant.

The inconsiderate and extravagant use of the telegraph lines imposes at times extra hours and hardships upon the men of the Signal Corps. This, however, is not confined to the Philippines alone. On this point Major Greene reports:

> On account of the infrequent and irregular mail service in this department, the great number of persons who have the privilege of free official telegraphing, and the natural inclination to use the easiest means of communication, the telegraph line is overloaded. Through very long hours, averaging twelve hours daily, and at relay stations (this includes Sundays and holidays), this causes actual and unnecessary hardship to the signal-corps operators. There is no practical remedy for this state of affairs, for although orders, military and civil, forbidding use of the telegraph when the mail would answer, and cautioning against the use of any but the barest number of words to convey the meaning, are in existence, it would appear that little heed is paid to them.

### TRANSFER OF LINES.

The transfer of the telegraph system to civil authorities progresses steadily, though very slowly. The civil government has been unceasing in its cooperation with the Signal Corps in maintaining this system of intercommunication, which is indispensable not only to the prosperity but to the successful government of the Philippines. Allotments for the purchase of additional cable, and the maintenance of smaller offices not absolutely essential for military purposes, have been made by the civil government, which appropriates for this purpose the amount of commercial tariffs, which are turned in to the insular treasury.

Altogether, harmony and cooperation have marked the relations of the civil and military services during the past year. A map showing the limitations of each system is inclosed.

### VISUAL SIGNALING.

On this subject, Capt. Daniel J. Carr, chief signal officer Department of Visayas, says:

> Practical use of visual signaling was made between the military forces at Camp Connell and Tarangnan, Samar, about 10 miles. Heliographs were used until April last, when two field acetylene lanterns were issued, so that communication could be established nightly. Clouds rendered the heliograph only intermittently available, and the lanterns, therefore, serve a very useful purpose.
>
> From the temporary headquarters of the commanding general of the department on board the U. S. C. T. *Carmen*, the transaction of business was facilitated by visual signaling conducted by the Signal Corps with the naval boats assisting in the pacification of eastern Samar.
>
> The simpler visual signaling appliances have been issued to separate units of the civil forces operating in the field, and it is understood that valuable use has been made of them.

Major Greene, chief signal officer Department of Mindanao, adds:

> The instruction of the line of the Army in visual signaling required by Army Regulations, paragraph 1594, has not been effective, many organizations falling short of the requirements.

### UNITED STATES.

The operations in the United States include the fire-control and fire-direction systems of the coast and field artillery; the equipment of rifle ranges; the management of military telegraph lines; the establishment of post telephone exchanges; the signaling equipment of the National Guard; ballooning work; preparation of manuals, and the training of recruits in visual, electrical, and telephonic work, and especially in suitable provisionary methods for active and efficient work in case of war or other emergency.

Except as to military ballooning, the duties of the Signal Corps have been as satisfactorily and efficiently performed as the limited force and the appropriations would permit.

### ORGANIZATION OF THE SIGNAL CORPS.

The following officers were serving in the Signal Corps on September 30:

| No. | Name and rank. | Stations and duties. (Foreign service since appointment as regular officer.) | At present station since— | Born. |
|---|---|---|---|---|
| | *Chief Signal Officer, Brigadier-General.* | | | |
| 1 | ADOLPHUS W. GREELY | Washington, D. C.<br>Foreign service (inspection duty in Alaska, Cuba, and the Philippines), one year and three months. | | Mar. 27, 1844 |
| | *Colonel.* | | | |
| 1 | James Allen | Assistant to Chief Signal Officer, Washington, D. C.<br>Foreign service in Alaska, Cuba, Porto Rico, and the Philippines, two years seven months and six days. | Oct. 24, 1904 | Feb. 13, 1849 |

| No. | Name and rank. | Stations and duties. (Foreign service since appointment as regular officer.) | At present station since— | Born. |
|---|---|---|---|---|
| | *Lieutenant-Colonels.* | | | |
| 1 | Richard E. Thompson | Chief signal officer Philippines Division, Manila, P. I.<br>Foreign service in the Philippines, two years three months and five days. | Nov. 30, 1904 | Jan. 18, 1848 |
| 2 | George P. Scriven | Chief signal officer Department of the East, Army Building, New York City.<br>Foreign service in China, Cuba, and the Philippines, one year eleven months and sixteen days. | Dec. 14, 1904 | Feb. 21, 1854 |
| | *Majors.* | | | |
| 1 | William A. Glassford | Chief signal officer Department of the Columbia, Seattle, Wash.<br>Foreign service in Alaska, Porto Rico, and the Philippines, four years eight months and twelve days. | Oct. 18, 1904 | Apr. 11, 1853 |
| 2 | Frank Greene | Chief signal officer Department of Mindanao, Zamboanga, P. I.<br>Foreign service in Alaska, Cuba, and the Philippines, four years six months and thirteen days. | Mar. 11, 1905 | Mar. 16, 1849 |
| 3 | Samuel Reber | Washington, D. C.; on duty with the General Staff.<br>Foreign service in Cuba and Porto Rico, ten months and sixteen days. | Aug. 15, 1903 | Oct. 16, 1864 |
| 4 | George O. Squier | Assistant commandant of the Signal School at Fort Leavenworth, Kans.<br>Foreign service in the Philippines, two years two months and twenty-six days. | Aug. 5, 1905 | Mar. 21, 1865 |
| 5 | Edgar Russel | Office Chief Signal Officer, Washington, D. C.<br>Foreign service in Alaska and the Philippines, three years and twenty days. | Jan. 4, 1904 | Feb. 20, 1862 |
| 6 | Eugene O. Fechét | Chief signal officer Department of the Missouri, and commanding officer Fort Omaha, Nebr.<br>Foreign service in the Philippines, two years one month and twenty-nine days. | Sept. 18, 1905 | Mar. 14, 1846 |
| | *Captains.* | | | |
| 1 | Charles McK. Saltzman | Student at the Signal School at Fort Leavenworth, Kans.<br>Foreign service in Cuba and the Philippines, two years nine months and eight days. | Aug. 15, 1905 | Oct. 18, 1871 |
| 2 | Benjamin F. Montgomery | Benicia Barracks, Cal | May 14, 1905 | July 5, 1853 |
| 3 | Daniel J. Carr | Chief signal officer Department of the Visayas, Iloilo, P. I.<br>Foreign service in the Philippines, seven months. | Mar. 15, 1905 | Nov. 25, 1860 |
| 4 | Carl F. Hartmann | Valdez, Alaska<br>Foreign service in the Philippines, two years two months and twenty-eight days. | Sept. 3, 1905 | Jan. 17, 1868 |
| 5 | George C. Burnell | Commanding officer, Fort Wood, N. Y.<br>Foreign service in Alaska, two years three months and twenty-seven days. | Feb. 25, 1904 | July 5, 1868 |
| 6 | Leonard D. Wildman | Chief signal officer Department of California, San Francisco, Cal.<br>Foreign service in Alaska and the Philippines, two years four months and twenty-eight days. | Sept. 1, 1905 | Oct. 13, 1868 |
| 7 | Charles B. Hepburn | Manila, P. I<br>Foreign service in the Philippines, seven months and eighteen days. | Oct. 29, 1904 | Aug. 14, 1868 |

| No. | Name and rank. | Stations and duties. (Foreign service since appointment as regular officer.) | At present station since— | Born. |
|---|---|---|---|---|
| | *Captains*—Continued. | | | |
| 8 | Otto A. Nesmith | Commanding signal corps company at Fort Omaha, Nebr.<br>Foreign service in Alaska and Cuba, three years one month and twenty days. | Sept. 19, 1905 | Mar. 7, 1852 |
| 9 | Walter L. Clarke | Commanding officer Benicia Barracks, Cal.<br>Foreign service in Alaska and the Philippines, two years one month and fifteen days. | Apr. 17, 1905 | Mar. 10, 1863 |
| 10 | Basil O. Lenoir | Assistant to the chief signal officer Department of the East, Army Building, New York City; commanding officer U. S. cable boat Cyrus W. Field since October 16, 1904.<br>Foreign service in the Philippines, one year and three months. | Dec. 8, 1903 | Nov. 12, 1858 |
| 11 | William Mitchell | Commanding signal corps company at Fort Leavenworth, Kans.<br>Foreign service in Alaska, one year eight months and eighteen days. | Oct. 18, 1904 | Dec. 29, 1879 |
| 12 | Henry W. Stamford | Chief signal officer Department of Luzon, Manila, P. I.<br>Foreign service in China and the Philippines, one year eleven months and two days. | Apr. 28, 1905 | Mar. 19, 1866 |
| 13 | Charles S. Wallace | Seattle, Wash.; commanding officer transport Burnside, serving as cableship for Signal Corps in Alaskan waters, pertaining to the installation of the Alaskan cable.<br>Foreign service in Alaska and the Philippines, two years seven months and ten days. | May 6 1904 | Sept. 11, 1866 |
| 14 | George S. Gibbs | Disbursing officer, Signal Corps, Washington, D. C.<br>Foreign service in Alaska, two years and twenty days. | Feb. 19, 1904 | Dec. 14, 1875 |
| 15 | Charles DeF. Chandler | Office Chief Signal Officer, Washington, D. C.<br>Foreign service in Alaska and the Philippines, two years three months and seven days. | Feb. 1, 1905 | Dec. 24, 1878 |
| 16 | Henry S. Hathaway | Fort Omaha, Nebr<br>Foreign service in the Philippines, one year two months and nine days. | Oct. 2, 1905 | July 6, 1872 |
| 17 | Richard O. Rickard | Student at the Signal School at Fort Leavenworth, Kans.<br>Foreign service in Alaska and the Philippines, one year ten months and sixteen days. | Oct. 29, 1904 | July 15, 1874 |
| 18 | Mack K. Cunningham | Student at the Signal School at Fort Leavenworth, Kans.<br>Foreign service in the Philippines, two years four months and seventeen days. | Aug. 15, 1905 | Feb. 14, 1870 |
| | *First Lieutenants.* | | | |
| 1 | Reginald E. McNally[a] | On duty with signal corps company at Fort Leavenworth, Kans.<br>Foreign service in the Philippines, two years eight months and twenty-two days. | Sept. 17, 1905 | Nov. 27, 1877 |
| 2 | Joseph W. Beacham, jr.[a] | Manila, P. I.<br>Foreign service in the Philippines, two years seven months and six days. | May 11, 1904 | Apr. 8, 1878 |
| 3 | William A. Kent[a] | Fort Wood, N. Y.<br>Foreign service in the Philippines, three years one month and twenty-four days. | Feb. 6, 1905 | Nov. 22, 1874 |

[a] First lieutenant, Signal Corps, by detail under act of Congress approved March 2, 1903.

| No. | Name and rank. | Stations and duties. (Foreign service since appointment as regular officer.) | At present station since— | Born. |
|---|---|---|---|---|
| | *First-Lieutenants*—Cont'd. | | | |
| 4 | Lawrence P. Butler[a] | Commanding signal corps company at Fort Omaha, Nebr.<br>Foreign service in the Philippines, one year and eleven months. | Sept. 12, 1905 | Jan. 23, 1868 |
| 5 | Alfred T. Clifton | Benicia Barracks, Cal.<br>Foreign service in Alaska and the Philippines, one year one month and twenty-nine days. | Mar. 20, 1905 | May 26, 1875 |
| 6 | Otto B. Grimm | Iloilo, P. I.<br>Foreign service in Alaska and the Philippines, three years nine months and twenty-seven days. | July 29, 1905 | Nov. 30, 1873 |
| 7 | Frederick L. Buck[a] | Fort Wood, N. Y.<br>On two months' leave of absence since July 6, per par. 12, Special Orders, No. 133, War Department, Washington, June 9, 1905. | Sept. 7, 1905 | Aug. 29, 1875 |
| 8 | William A. Covington[a] | Chief signal officer Department of the Gulf, Atlanta, Ga. | Mar. 26, 1905 | June 7, 1873 |
| 9 | Alvin C. Voris[a] | St. Michael, Alaska<br>Foreign service in the Philippines, three months and five days. | Sept., 1905 | Jan. 5, 1876 |
| 10 | George E. Kumpe[a] | Benicia Barracks, Cal.<br>Foreign service in the Philippines, one year three months and ten days. | June 17, 1904 | May 12, 1876 |
| 11 | Gordon Johnston[a] | Assistant to chief signal officer, Department of Mindanao, Zamboanga, P. I.<br>Foreign service in Cuba and the Philippines, one year four months and seven days. | May 9, 1905 | May 25, 1874 |
| 12 | E. Alexis Jeunet[a] | Signal corps depot, Fort Myer, Va.<br>Foreign service in the Philippines, eight months and four days. | July 3, 1905 | Mar. 1, 1872 |
| 13 | John E. Hemphill[a] | Fort Gibbon, Alaska<br>Foreign service in Alaska and the Philippines, two years two months and sixteen days. | Sept. 17, 1905 | June 4, 1867 |
| 14 | William M. Goodale[a] | Benicia Barracks, Cal.<br>Foreign service in the Philippines, eight months. | Feb. 2, 1904 | Jan. 19, 1872 |
| 15 | Allan L. Briggs[a] | Manila, P. I.; disbursing officer and acting quartermaster and commissary, Signal Corps, in Philippines, since July 1, 1905.<br>Foreign service in the Philippines, seven months. | Mar. 2, 1905 | Feb. 14, 1873 |
| 16 | James S. Butler[a] | Manila, P. I.; in charge of cable operations on U. S. A. T. "Liscum" in Philippines, since Jan. 10, 1905.<br>Foreign service in the Philippines, one year and two days. | Nov. 30, 1904 | Nov. 19, 1877 |
| 17 | William C. Fitzpatrick[a] | U. S. General Hospital, Fort Bayard, N. Mex., under medical treatment.<br>Foreign service in Alaska, one year eleven months and two days. | Aug. 4, 1905 | June 6, 1876 |
| 18 | Vacancy[b] | | | |

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[a] First lieutenant, Signal Corps, by detail under act of Congress approved March 2, 1903.
[b] To be filled by detail from the line of the Army.

STATIONS, AND DATES OF ARRIVAL AT, OF COMPANIES OF THE SIGNAL CORPS.

| Company— | Station. | At stations since— |
|---|---|---|
| A | Fort Leavenworth, Kans | Oct. 18, 1904 |
| B | Fort Omaha, Nebr | Sept. 12, 1905 |
| C | Valdes, Alaska | Sept. 3, 1905 |
| D | Fort Omaha, Nebr | Sept. 19, 1905 |
| E | Philippine Islands | May 28, 1899 |
| F[a] | Benicia Barracks, Cal | Jan. 15, 1905 |
| G | Fort Wood, N. Y | Feb. 25, 1904 |
| H | Benicia Barracks, Cal | Apr. 17, 1905 |
| I | Philippine Islands | Oct. 29, 1904 |
| K | Fort Gibbon, Alaska | Nov. 5, 1904 |
| L | Philippine Islands | Mar. 2, 1905 |

[a] Under orders for duty in the Philippines.

The Signal Corps has an authorized strength of 1 brigadier-general, 1 colonel, 2 lieutenant-colonels, 6 majors, 18 captains, 18 first lieutenants, 36 master signal electricians, 132 first-class sergeants, 144 sergeants, 156 corporals, 552 first-class privates, 168 privates, and 24 cooks; in all, 46 officers and 1,212 enlisted men. Of these 15 officers are detailed from the line of the Army. There now exists 1 vacancy among the first lieutenancies, caused by the retirement, from disability, of Maj. Joseph E. Maxfield, while the enlisted vacancies number 36.

In reorganizing the enlisted force of the Army the necessity of the Signal Corps for more officers should be recognized, as at least 5 additional officers are urgently needed. It is also urged that the discrimination against the Signal Corps in the way of rank be removed by giving the Corps a just proportion of field officers, it being at present 22 per cent the smallest of any staff corps. Under existing conditions the majority of the able and zealous officers of the Corps are prevented from obtaining promotion accorded to every other corps in the Army. It is extremely important that 1 colonel, and 1 lieutenant-colonel, 1 major, 2 captains, and 2 first lieutenants be added to the Corps. This would widen the field of selection for the position of Chief Signal Officer of the Army, now practically confined to a single colonel, and give a much needed flow of promotion. This would still leave the Signal Corps with the smallest percentage of field officers.

Important electrical work requires in commercial life ability of the highest character, which is correspondingly rewarded. If efficient service in time of war is expected from the Signal Corps, the rank and pay of its officers should not be inferior to those of every other corps.

The Chief Signal Officer of the Army has loyally endeavored to make a success of the detail system, now in its third year. As volunteers have failed conscription was necessary in the case of the sixteen officers already detailed, of whom fully one-fourth have endeavored to evade service through personal or political influence.

While knowing the ability of those officers in the line of the Army, the Chief Signal Officer can not, however, fail to recognize that only a moderate percentage have the aptitude and predilection which contribute so much to the efficiency of officers when on satisfactory duty. Practically branded, as some of these officers have been, as deserters from the line to the Signal Corps, although in reality conscripts, the outlook is unfavorable for that success in rotation of duty for which the Chief Signal Officer earnestly labors.

The detail system in many respects is valuable; in other ways it is not. It previously failed in the Signal Corps, where it was tried for twenty-five years. If the detail system continues, it is recommended that it be carried out to its logical conclusion under conditions which will make practical the important principles of selection and elimination.

It is therefore suggested that the entire commissioned force of the Army, excluding the permanent technical corps, be arranged in one lineal list below the grade of brigadier-general. Officers can then be assigned in the Army, as now in the Navy, to any duty in the service for which they are specially fitted, and relieved therefrom when no longer efficient in their work. Through a system of annual retirement a suitable flow of promotion and elimination by retirement, as is done in the Navy, of officers incompetent, either morally or professionally, would then be practicable, and thus materially improve the service. Distinguished services could then be rewarded, without marked discrimination against equally competent officers who have not had opportunities, through advancement by files, the recipient being an extra number confirmed by the Senate.

## ENLISTED MEN.

The enlisted force, which aggregated 1,176 on June 30, 1905, has experienced the following changes: Enlisted and reenlisted, 598, of whom 431 were recruits; deserted, 52, being 4.4 per cent of the total force; died, 7, 0.6 per cent; discharged for disability, 10, 0.8 per cent. One was promoted to be second lieutenant of infantry, through competitive examination.

The difficulty in retaining enlisted men of intelligence and character, thoroughly suited for the most important duties in the Signal Corps, has been somewhat though not entirely obviated by the addition of the grade of master signal electrician. The Chief Signal Officer of the Army is filling this grade with men of such character and aptitude as will fit them for especially important duties in ballooning, dynamo work, telegraphy, telephony, cable splicing, cable laying, power plants, line inspecting, and other difficult work, technical and administrative. Of the 12 originally appointed by selection, 10 proved by examinations that they would have attained their grade by competition. Special and extraordinary ability along certain lines has caused the appointment of one or two others, subject to noncompetitive examinations. The fixed policy of the office is to fill vacancies through competitive examination of first-class sergeants whose service, habits, intelligence, and zeal merit their designation as candidates. About half of the examination is practical, a weight of 25 per cent being given to the candidate's official record alone.

War emergencies having caused the appointment of many first-class sergeants for special reasons, it develops that some are neither well grounded technically nor possessed of special administrative ability. To decline the continuance of warrants to those reenlisting would work an injustice, especially in view of past services on foreign stations. To raise the standard of first-class sergeants, orders have been issued confining such promotions to an eligible list formed from sergeants of good character and efficient service, who have demonstrated by noncompetitive examinations suitable knowledge of the essentials of signal-corps work, their military record being given a weight of 25 per cent.

As doing things rather than knowing them is the glory of an army, extraordinary services in the field will, in the future as in the past, insure exceptional advancement to signal-corps men.

### OFFICE OF THE CHIEF SIGNAL OFFICER.

The rapid development of the fire-control work of the Signal Corps has enlarged to an extraordinary degree the volume of business transacted in this office, where the War Department force consists of 5 officers and 23 employees, whose work as regards the coast defenses is supplemented by a clerical force paid from the fire control appropriations.

Special credit is due Col. James Allen, principal assistant; Maj. Edgar Russel, in charge of the electrical division; and Capt. George S. Gibbs, disbursing officer, for the unusual ability and resourcefulness displayed in the transaction of the overwhelming business with an inexperienced and scarcely adequate force.

Notwithstanding the adoption of approved business methods of transacting the immense volume of official papers in this office, it has been with the greatest difficulty that the records have been handled. It is lamentable that in the important work of the Signal Office it has been impracticable to detail a sufficient clerical force to make proper record of its official communications. During the year ending June 30, 1905, no less than 388,545 official papers have been acted upon, an increase of above 30,000 as compared with the preceding year.

The reorganization of the Signal Office into five divisions—administrative, disbursing, electrical, telegraph, and examining—has coordinated and harmonized its business methods. From time to time, as has been found possible, the simplest methods of transacting business, compatible with the public interests, have been adopted.

With very rare exceptions the clerical force has displayed intelligence, zeal, and fidelity, and it is doubted whether as large an amount of clerical work per man has been transacted in any other bureau. The office suffers, as it has in the past, from inexperience due to a constant change of force.

Owing to the inadequate salaries paid in this office, as compared with others, special difficulty has been experienced in keeping filled positions as stenographers at $900, a salary barely above that of a messenger. During the past seven years, out of 80 employees there have been 57 resignations and transfers, 71 per cent of the whole force. Under these conditions it is believed to be in the public interests to recommend the addition of one clerk of class 3, there being none of this grade in the office; and if the two clerks at $900 could have their compensation increased to $1,000, the permanency of the force would be greatly increased.

For the high class of work required of clerks in the Bureau, who must possess more than ordinary ability, the compensation should be in accordance therewith.

### ADMINISTRATIVE DIVISION.

The administrative division has charge of the routine work of the Signal Office—the mail, general office correspondence, the office files, muster rolls, reports, and all matters affecting the commissioned, enlisted, and civilian force of the Signal Corps. This division, with an inadequate clerical force, has by assiduous and systematic effort of the chief clerk, George A. Warren, satisfactorily transacted its largely increased business.

### DISBURSING DIVISION.

This division is charged with the preparation of estimates for appropriations by Congress—accounts, requisitions, and transfers from appropriations, quotations, samples, and advertisements, abstracting bids, making awards, placing orders, inspection, shipment, invoicing and accounting of supplies, payment of accounts, collecting bills, and all other duties pertaining to disbursements. The duties of disbursing officer have been performed most efficiently and promptly by Capt. George S. Gibbs, whose report shows that in the regular inspection of his accounts no errors have been found during the year and no disallowances have been made by the Auditor for the War Department.

In urging a much needed increase in clerical force, the disbursing officer reports that his 6 clerks have handled 152,759 papers during the year. The work has been performed only by the unremitting attention of clerks to duty.

The following table shows the state and disposition of appropriations, aggregating $1,306,273.36:

*Statement, 1905.*

| Appropriation. | Disbursements in Washington. | Allotments.[a] | Cash in Treasury. | Total. |
|---|---|---|---|---|
| Signal Service of the Army, 1905 | $119,951.82 | $58,108.40 | $30,439.78 | $208,500.00 |
| Coast artillery fire-control installation | 144,450.06 | 67,183.92 | 288,366.02 | 500,000.00 |
| Submarine cable: | | | | |
| Valdez to Seward, Alaska | 87,495.75 | 4,867.00 | 2,637.25 | 95,000.00 |
| Washington to Alaska | 299,466.39 | 22,113.61 | ............ | 321,580.00 |
| Military telegraph and cable lines, Alaska | 565.77 | ............ | 17,207.59 | 17,773.36 |
| Total | 651,929.79 | 152,272.93 | 338,650.64 | 1,142,853.36 |

[a] Allotted to disbursing officers in the Philippines, Alaska, and various military departments in the United States.

### TELEGRAPH DIVISION.

This division, now under charge of Capt. C. DeF. Chandler, exercises supervision over all means of electrical communications, except such as pertain to fire control, having charge of the operation, maintenance, and repair of United States Signal Corps telegraph, telephone, and cable lines, and the installations in target ranges. The post telegraph systems and telephone exchanges for administrative purposes impose, by their importance and extent, much work.

In this division is kept a card record pertaining to target ranges, post telephone systems, military telegraph lines in the United States, Alaska, and the Philippines, War Department telegraph codes, and other incidental matters.

The volume of new business caused by the increase of the Alaskan telegraph lines has been enormous, but by unremitting work of the clerks in charge it has been kept up to date.

For the year there were 1,412 requisitions received in this division, which, as a general rule, are forwarded to the respective supply depots on the same day on which they are received.

### EXAMINING DIVISION.

Here are examined all money and property returns pertaining to the Signal Corps of the Army. All money accounts have been examined and forwarded within the limit fixed by law and regulations. By great diligence and application, all property returns pertaining to the Signal Corps men serving in the United States and Alaska have been kept up to date in their examination. It has been impossible to reexamine the very large number of returns from the Philippines, which have been passed on in a preliminary manner by the auditing division in Manila. It is believed, however, that the scrutiny there given should be final. Certainly it is impracticable to reexamine them formally and fully in this office with the present force.

### ELECTRICAL DIVISION.

This division has charge of the electrical work of the Signal Corps, the selection of special and general apparatus and devices, of executive functions relative to electrical matters and fire control, and requisitions for electrical material and supplies, excepting such as pertain to the telegraph division. Although newly organized, it has, on account of the magnitude of the rapidly growing work, become one of the important divisions of the office and has handled a very large amount of business.

From July 1 to March 16 the office was under charge of Lieut. W. A. Covington, Signal Corps, and from the latter date until June 30, 1905, it was under Maj. Edgar Russel, Signal Corps, who have most efficiently performed their respective duties.

The general classes of work assigned to this division are:

1. Fire-control communications, coast artillery, and experimental fire-control service of field artillery.
2. General direction of the civilian engineers and electrical assistants engaged in various branches of electrical work and inspections.
3. Supervision and control of the test room and instrument maker's room.
4. Preparation of plans, drawings, and blueprints required for signal corps work.
5. Consideration of various technical questions, largely electrical, bearing on the improvement of signal corps work.

The efficiency of the division is due largely to the chief clerk, Mr. H. S. Flynn, who has had the assistance of a number of very capable clerks, and who met the unusually severe work of the office cheerfully.

The draftsmen's room, under Mr. William Welch, has turned out an enormous amount of work, necessitated by the large number of technical drawings required in preparing for the new equipments of the Signal Corps. The preparation of drawings for both the new manuals also occurred during the year. The character of all the work of the draftsmen has elicited the highest praise from all. Very few criticisms of the working drawings are received from manufacturers.

The signal corps test room has been very busily engaged in the numerous tests required to cover commercial orders now being placed for large quantities of materials for the Signal Corps. Before any of the numerous new devices are adopted, a thorough test is made of all the separate parts of the apparatus, an accurate decision reached regarding dimensions, resistances of the coils, etc. Continuous tests are carried on as to the capabilities of different kinds of batteries, both storage and primary, and these tests alone will save thousands of dollars to the Government, in addition to insuring good service in place of bad at critical periods.

Adjacent to the signal corps test room is a large model room in which is installed a complete fire-control outfit, wherein is simulated a small fire command with instruments so set up and marked that the entire system can be readily comprehended and an exhibition be given of the fire command in active operation, as far as range finding and fire control is concerned. In addition to these instruments there are being assembled typical samples of all the electrical and visual equipments required by the Signal Corps.

Important and delicate models, on which experiments are to be made, have been constructed by Mr. Adolph Mayer, whose unsurpassed skill as an instrument maker and his intelligent cooperation have been of the greatest assistance.

The preparation of plans and drawings, as already stated, is under the control of the draftsmen's room. Adjacent to this is the blueprint room, where a very excellent electric blueprint machine is installed for printing the very large volume of blueprints, drawings, and maps now required by the Signal Corps. A large number of negatives of apparatus and maps are being collected, and a Cooper-Hewitt mercury vapor lamp for printing these has been installed.

In addition to the above work, various telegraph and telephone devices, in use by the Signal Corps in general, are constantly being considered. This is especially necessary in deciding upon the electrical problems connected with the field equipment of the Signal Corps, and thereby decisions have been reached as to the best patterns of field telephones and buzzers.

## BOARD ON EQUIPMENT AND AWARDS.

In order to insure steady improvement in equipment and economical administration of the Signal Corps, there has been formed a Board on Award and Equipment. These officers examine all bids on Signal Corps material with a view to insuring the delivery of thoroughly reliable apparatus, first-class in workmanship and in material.

They further consider from time to time improvements in methods and in apparatus suggested by officers or men of the Signal Corps, and supplement these recommendations by careful and comparative studies of similar apparatus in commercial or foreign military use.

Much has been accomplished toward the standardization of articles and the formulation of efficient methods and apparatus for field work.

## SIGNAL CORPS MANUALS.

During the year the Chief Signal Officer of the Army, recognizing the necessity for keeping the technical publications of the office in line with rapidly advancing improvements, has had Signal Corps Manuals Nos. 1, 3, and 4 thoroughly revised and enlarged in scope.

Manual No. 1 (Telephones) has been combined with Manual No. 3 (Electrical Instruments and Equipments) in one enlarged publication, now designated as Manual No. 3. The various advances in telegraphy, line construction, telephony, subterranean and aerial cable work have been brought up to date.

Manual No. 4 (Submarine Cables) has been much enlarged and improved. It includes a description of the method of operation of the long submarine cables of the Alaskan system, and, in addition, contains an extension of the chapters on testing and location of faults.

In order to keep up with the rapid changes and advances in the equipment, especially of fire-control apparatus, the electrical division issued two publications for limited distribution to those immediately interested—Memorandum No. 4 treating of the new fire-control apparatus installed at Fort Monroe, Va., and Memorandum No. 5, which describes in a complete way the use of the electrical engineers' testing sets.

### ELECTRICAL FIRE-CONTROL STAFF.

This force, composed of electrical engineers and other expert assistants, is assigned to the military departments as the exigencies of the service demand. Electrical Engineer R. A. Klock, stationed in Washington under the direction of Maj. Edgar Russel, officer in charge of the electrical division, has general supervision of the working plans and specifications for the fire-control service and of the testing room of the Signal Corps.

Extensive fire control work in the Department of the East is technically supervised by Electrical Engineer Townsend Wolcott, who with several assistants also make inspections of electrical material and supplies. Electrical engineers are also on duty in the Department of California, Department of the Gulf, Department of the Columbia, on the cable ship *Burnside* in Alaskan waters, and the cable ship *Liscum* in Philippine waters.

Several of these assistants are men of marked professional ability and, with rare exceptions, expert, resourceful, and tactful in their difficult work.

### ESTIMATES AND EXPENDITURES.

The estimates of the Signal Corps pertain to appropriation bills, that for fire-control installations for coast defense relating to the fortification bill, while the rest of the estimates relate to the army bill.

The estimates for the Army proper, despite increased work, are not increased, while those for Alaskan cable purposes are entirely omitted.

The estimates for fire-control purposes, although confined to emplacements already constructed, are necessarily larger than the appropriations for the present year.

### MILITARY DEPARTMENTS.

Under paragraph 1594, Army Regulations, department commanders supplement the operations of the Signal Corps by such instruction in visual military signaling as they deem necessary for the public service. The instruction in the line of the Army contemplates that each independent command should have at least two enlisted men able to exchange messages in the army and navy code at short distances by flag. Deficiencies in instructing the line of the Army in military signaling has in part resulted from inability to assign a signal officer to each military department. Of the nine departments in the United States, it has been possible to supply only four throughout the year with a signal officer. At the end of the fiscal year these signal officers were as follows: Department of the East, Lieut. Col. George P. Scriven; Department of the Gulf, First Lieut. William A. Covington; Department of Texas, First Lieut. George V. H. Moseley, First Cavalry; Department of California, Maj. George O. Squier; Department of the Columbia, Maj. William A. Glassford; Department of the Colorado, Second Lieut. John S. McCleery, Twentieth Infantry; Department of the Missouri, Capt. Charles McK. Saltzman; Department of Dakota, First Lieut. Walter S. Grant, Third Cavalry; Department of the Lakes, Maj. Hunter Liggett, Military Secretary.

Several other officers of the line have also served as department signal officers for brief periods, performing these duties in addition to others having a prior claim.

Under these conditions the Signal Corps has been fortunate in obtaining in all cases good, and in some cases very efficient, service from detailed officers.

The Department of the Columbia appears to lead as regards efficiency in visual signaling.

Military telegraph lines, treated elsewhere, have been operated in the departments of the Colorado, Texas, the Missouri, and Dakota.

Special attention has been given to fire-control work, as stated elsewhere, in the departments of the East, the Gulf, the Columbia, and California.

Posts garrisoned entirely by the Signal Corps are: Fort Wood, Department of the East; Fort Omaha, Department of the Missouri, and Benicia Barracks, Department of California, these being spoken of under the head of "Signal corps posts."

## SIGNAL CORPS POSTS.

The Chief of Staff recommended, and the Secretary of War approved, the plan of stationing signal corps companies in the United States at selected posts with a view to their more economical utilization in case of emergency and their suitable training for special work.

The plan looked to the stationing of a separate signal corps command, so that it might cover the general needs of the service in each of the four military divisions. This has been accomplished by the garrisoning entirely of Fort Wood, New York Harbor, for the Atlantic Division; Omaha Barracks for the Northern Division, and of Benicia Barracks for the Pacific Division. There being no convenient post in the Southwestern Division these interests are to be cared for by the signal corps company stationed at Fort Leavenworth, Kans., where it is also utilized in connection with the Signal School lately opened at that post. In this connection the signal corps post, Fort Myer, Va., is abandoned, its stores and garrison being transferred to Omaha Barracks, which has been officially designated as the central signal corps post of the United States with a garrison of four companies.

This rearrangement promises to largely increase the professional efficiency of the men and officers of the Signal Corps, and likewise establishes harmonious relations with the line of the Army, as the troops of the Signal Corps are now serving under identically the same conditions as the artillery, cavalry, and infantry.

Special classes of duties are cared for by the different posts in addition to ordinary signal-corps work. At Fort Wood, which has been most efficiently commanded by Capt. George C. Burnell, Signal Corps, a special school of instruction in fire-control work, submarine cables, etc., has been established, this post being a depot for all fire-control material east of the Rocky Mountains. At this post is stationed Company G, Signal Corps, and in its infrequent periods of inaction the cable boat *Cyrus W. Field* will be there located.

At Omaha Barracks, which is now garrisoned by two companies, B and D, under command of Maj. Eugene O. Fechet, Signal Corps, who also serves as chief signal officer Department of the Missouri, will be ultimately concentrated the principal methods of instruction for enlisted men of the Signal Corps. Pending this concentration steps have been taken to coordinate the instruction of the men at different posts so that those transferred may not lose the advantage of instruction already given.

At Fort Leavenworth, signal corps Company A has been assigned as part of the garrison. This experimental step has been most fruitful in its results, the company, under the command of Capt. William Mitchell, Signal Corps, having won the commendations of the various post commanders for its soldierly and efficient condition. In addition to garrison work, it is also utilized for the purpose of instructing students of the Staff College, Cavalry, Infantry, and Signal schools at Fort Leavenworth. This company has been brought to a very high degree of efficiency and can be put into the field at an hour's notice equipped for signal-corps work of any kind or character, excepting only submarine cables and ballooning, its specialty being field telegraphy, telephony, and visual communications between separate and rapidly moving bodies of troops.

## SIGNAL CORPS OF THE NATIONAL GUARD.

The importance of military lines of information has been generally recognized by the organized militia of the United States, and the harmonious relations of the Signal Corps of the Army with the signal organizations of the National Guard have been unceasingly fostered.

There exists, as shown by the last militia report of the War Department, signal corps organizations with commissioned officers and enlisted men in the States of California, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Nebraska, New Hampshire, New Jersey, New York, Ohio, Rhode Island, Texas, Utah, Washington, West Virginia, the Territory of Oklahoma, and the District of Columbia. A detachment under a noncommissioned officer has also been organized in the Territory of Arizona.

Frequent applications have been made, which unfortunately could not be granted, for signal corps detachments of the regular establishment to serve in encampments of the National Guard. The official visit of Capt. Geo. C. Burnell to the encampment of the National Guard of the State of New York, and that of Capt. Geo. S. Gibbs to the encampment of the National Guard of Massachusetts, and the presentation of a professional paper by Capt. Charles McK. Saltzman at the annual meeting of the Interstate Convention of the National Guard, St. Paul, proved most acceptable to the guard. In both instances great interest was shown by officers of the National Guard in the instruments and methods of the Signal Corps of the Army, which were exhibited with practical illustrations.

Numerous applications have been received from officers of the guard by the Chief Signal Officer of the Army, who has had pleasure in giving definite information not only regarding the character of duties imposed at various times upon the Signal Corps, but also as to the extent and kind of equipment necessary for efficient work in any particular direction, such as visual signaling by day, visual signaling by night, telephone exchange service, telegraphic work, etc.

## MILITARY MANEUVERS.

In the autumn of 1904 the signal-corps work connected with military maneuvers in the Department of the Columbia was in charge of Lieut. Col. R. E. Thompson, Signal Corps, that in the Department of California by Maj. George O. Squier, Signal Corps, and in the Atlantic Division by Capt. D. J. Carr, Signal Corps. These maneuvers were of great benefit to the Signal Corps, as in connection therewith there were important problems of communication which were solved with advantage to the Corps.

Camp communication was satisfactory, but it is doubtful whether the field electrical communications rise to the standard which the Chief Signal Officer of the Army has set for the Corps. As the maneuvers offered opportunities for experimental work, there were tested several varieties of outpost wire and also experimental methods.

The signal force was in each case insufficient, as experience has demonstrated the impossibility of providing entirely satisfactory field communications for an army corps with less than 2 per cent of the entire strength. In none of the above maneuvers did the Signal Corps have a force of 1 per cent to install and maintain its telegraph and telephone offices. Any defects that have been noted are largely remediable by the employment of an adequate force.

These maneuvers developed the fact that special training, which it is hoped the new Signal School at Fort Leavenworth will give, is necessary before many line officers are fully competent to handle extended lines of information.

On this subject the chief umpire, Maj. William P. Duvall, Artillery Corps, comments upon the performance of the Signal Corps during the military maneuvers at Camp Atascadero, California, in his official report, as follows:

> Throughout the maneuvers the operations of the Signal Corps were characterized by painstaking preparation, including carefully drawn orders for each day's work, and by much energy and efficiency during the execution of the exercises. In the main said operations were distinctly successful, much more so than at any of the three other maneuver camps in which this Corps has come under my personal observation.
>
> I can clearly confirm the recurring complaint of the signal officers that commanding officers of the forces often ignore the presence of the instruments, even when at their elbow and in complete readiness for use. Indeed in two cases which I witnessed this neglect was flagrant.

It may be added, that photographs taken in connection with these maneuvers strongly illustrate the value of photography in the study of terrane as well as in the locating of troops.

## MILITARY TELEGRAPH LINES.

The following military lines were in operation at the end of the fiscal year:

| From— | To— | Length. | Messages handled. |
|---|---|---|---|
| | | *Miles.* | |
| Price, Utah | Fort Duchesne | 87.0 | 7,602 |
| Huachuca, Ariz | Lewis Springs | 19.0 | 4,157 |
| Willcox, Ariz | Fort Grant | 28.0 | 2,202 |
| Fort Bayard, N. Mex | Bayard | 3.0 | 1,581 |
| Holbrook, Ariz | Fort Apache | 92.0 | 8,528 |
| Fort Assinniboine, Mont | Assinniboine | 1.25 | 2,543 |
| Fort Myer, Va | Fort Washington, Md | 21.5 | 3,468 |
| Fort Bliss, Tex | El Paso | 6.0 | 958 |
| Fort Clark, Tex | Spofford Junction | 9.5 | 3,287 |
| Fort Brown, Tex | Fort McIntosh | 237.0 | 22,318 |
| Fort Niobrara, Nebr | Valentine | 4.5 | 1,575 |
| Total | | 508.75 | 58,219 |

Short lines in the departments of the East, California, and Dakota, over which no charge is made, are omitted as comparatively unimportant.

There have been collected for the transmission of commercial telegrams over the military lines in the United States tariffs amounting to $2,111.06. This amount has been deposited in the Treasury of the United States, as required by law. In addition there has been collected and transferred to connecting commercial companies the sum of $6,954.41, covering tariffs for messages transmitted by such companies over their lines; 100,932 messages were handled.

The abandonment of a portion of the line from Fort Brown to Fordyce, Tex. (88 miles), and from Fort Ringgold to Fort McIntosh (121 miles) has been decided upon, and sale at public auction is now being negotiated. The section from Fordyce to Fort Ringgold will be maintained as at present.

The Price-Fort Duchesne line will shortly be condemned, and sold upon the completion of the Uintah Railway, now building from Dragon to Duchesne.

The Willcox-Fort Grant line has been submitted for the action of an inspector, with a view to its sale after the abandonment of Fort Grant.

The Bisbee-San Bernardino line, although built by the Government, has since July, 1903, been operated as a telephone line by the Bisbee Improvement Company, under an agreement with the Chief Signal Officer. Efforts were made to transfer this line to the customs service, but without success, and an agreement has been made for its condemnation and sale.

## POST TELEPHONE EXCHANGES.

Appreciating the advisability of providing military posts with suitable telephonic exchanges for the prompt and efficient transaction of public business, the Chief Signal Officer presented the matter to the Chief of Staff, recommending liberal facilities. The necessity of economy made it impracticable, however, to equip posts on a generous scale, so their number and location as fixed by the Chief of Staff was promulgated in War Department General Orders, No. 59, later amended by General Orders, No. 110, current series. As some posts have phones in large excess and others are unprovided action has been taken to reorganize all post systems in accordance with the latest order. It is hoped that more liberal allotments for this purpose may be practicable in future years.

Complications have resulted from the unathorized action of some post commanders in admitting private corporations not only to the use of Government lines for private exchange service but for the establishment of pay stations in public buildings. It is recommended that a well-defined policy be formulated for the guidance of the Army. Such policy should in no way discriminate in favor of any officer, should afford equal rights to competing commercial systems, and above all should conform to standard methods of line construction in the way of aerial or submarine cables.

### TARGET RANGES.

The installation of the standard equipment for target ranges, in conformity with Special Orders, No. 8, April 16, 1904, which was inaugurated during the latter part of the last fiscal year, has been satisfactorily continued along the lines indicated in the last annual report. The installations in general have given satisfaction, and have proven to be a very valuable and almost indispensable adjunct to small-arms firing practice.

Provision was made and supplies were shipped for the equipment of 33 ranges, 24 of which have been installed.

### COAST SIGNAL STATIONS.

The necessity of installing visual signaling apparatus at the important artillery coast defenses, so as to insure intercommunication between the Army and Navy, is recognized as a matter of importance. Whenever the National Board of Defense, now considering the question of armament and other means, shall have reported action will be taken to install such stations in their order of importance.

### THE LEWIS AND CLARK EXPOSITION.

The exhibit at this exposition, installed under the general supervision of Major Glassford, has been in charge of a noncommissioned officer of the Signal Corps. Though limited in space it covered all phases of the work except ballooning and fire control. The visual signaling exhibit has been supplemented by heliograph practice between Mount Hood and Portland, under Lieut. John B. De Lancey, through the cooperation of Brigadier-General Williams, commander of the Department of the Columbia.

The exhibit included instruments for all kinds of visual and electrical signaling and telegraphic and telephonic work, to which were added maps, reliefs, etc., connected with military work in Alaska, Cuba, the Philippines, and Porto Rico.

### INTERNATIONAL WIRELESS CONFERENCE.

The proposed conference for 1905 has been postponed. The Chief Signal Officer of the Army was named as the head of the delegation on the part of the United States thereto, and has collated data for use in connection therewith.

### AUTOMOBILES.

Although automobilism is as yet unsuitable for general transportation in the field, yet its utility and advisability for self-propelled vehicles for military purposes has been amply demonstrated. Auto-propelled vehicles have been purchased for experimental uses as parts of telegraphic trains.

## BALLOONING.

While the contemplated abandonment of signal corps post, Fort Myer, Va., has prevented ballooning work during the past year, yet much preliminary work has been done with a view to effective service when the location for ballooning and its plants for making and compressing gas are permanently settled. Investigations looking to important advances in the inflation of balloons in the field are now in progress.

## WAR DEPARTMENT TELEGRAPHIC CODE.

This code is in the process of revision and will appear at a very early date. It is believed that as regards the character of its code words, the scope of its phrases, its compactness and practicability, there will be very marked improvements upon the present code.

## SIGNAL SCHOOL, FORT LEAVENWORTH.

In coordinating the military instruction of the Army, the General Staff recommended, as promulgated in General Orders, No. 115, War Department, June 27, 1904, certain special service schools, among which is the Signal School, Fort Leavenworth, Kans.

The purpose of the school is to prepare the junior officers of the Signal Corps for the active duties of their profession, to provide theoretical and practical signal instruction for detailed line officers, and to improve the service of the Corps by practical tests and experiments with a view of the application of current industrial inventions to military purposes. The year's course covers visual signaling, electrical and mechanical engineering, aeronautics, photography; topography, and Spanish.

Particular importance is attached to field and practical operations, with directions and suggestions as to the higher theoretical courses. Fortunately the presence of a highly trained signal company affords unusual facilities for practical operation and management of lines of military information, whether visual, telegraphic, buzzer, telephone, or wireless, and in both temporary and permanent form.

The Signal School is under Brig. Gen. J. Franklin Bell, who coordinates its workings with other service schools at Fort Leavenworth. Maj. George O. Squier, Signal Corps, is assistant commandant and in direct charge. The school opened September 1, 1905, with 9 student officers, of whom only 3 were from the Signal Corps, owing to lack of officers and to pressure of duties elsewhere.

It is hoped that the seeming discrimination against the graduates of the Signal School through their nondesignation as qualified to enter the Staff College may be removed. Graduates from the other service schools and officers of engineers are qualified for entrance.

## WIRELESS TELEGRAPHY.

The Signal Corps interests itself in wireless telegraphy in the United States only as far as relates to equipping its field trains with portable outfits and to establishing such short routes as will insure prompt and reliable intercommunication between coast defenses and cooperating military forces.

As regards artillery stations there has been maintained the system connecting Fort H. G. Wright and Fort Schuyler, while that from Fort Hancock to Fort Wadsworth has been restored. An installation is in progress at Fort Wood, which will complete an intercommunicating system between the principal posts of the three artillery districts which defend the approaches to New York City, thus affording alternate routes in war or other emergency.

Pending the perfection of signal corps portable sets, commercial types are now in use for intercommunication during artillery target practice.

The devising of suitable field sets is intrusted to Maj. George O. Squier and to Capt. Leonard D. Wildman. The latter officer has demonstrated his unusual ability and resourcefulness in wireless telegraphy by his extraordinary success in the Nome-St. Michael installation. Major Squier's theoretical knowledge of the subject is widely recognized.

The devices when perfected will be given thorough field tests before adoption, and it is expected that a wireless set, capable of working 15 or 20 miles, can be transported on a single pack mule and be installed in a few minutes.

A most interesting result of Major Squier's wireless experiments was the discovery that vegetable antennæ are most efficient, and that growing trees are available for communication at distances of 30 or 40 miles. With the view of determining the conditions under which trees would be available for military systems, the Chief Signal Officer of the Army has directed that experiments be made to ascertain the degree of utility of trees when in full sap, under drought, or frozen, and also the relative value of different species of vegetation.

## FIRE-CONTROL CABLE BOAT.

The absolute impossibility of repairing fire-control cables by commercial boats was demonstrated by the unrepaired condition of the cables in the artillery district of New London for a period of seven months, leaving the Sound approaches of New York City defenseless. As a result the cable boat *Cyrus W. Field* was purchased and equipped, with the realization that she is unsuited for ocean work. It has been impossible for the *Field* to keep in repair the cables now laid, and another year will show the necessity of either obtaining another boat, or the disagreeable alternative of interrupted cables and disabled coast defenses. It will be absolutely necessary to build one seagoing and two harbor cable boats. Assuming that the *Field* can properly care for the Boston and Portland artillery districts, there is needed a seagoing boat for the districts of eastern New York, southern New York, and the Delaware, with harbor boats for San Francisco on the Pacific, and for the districts of the Potomac, the Chesapeake, and Baltimore on the Atlantic coast. The *Burnside* can care for Puget Sound in addition to her Alaskan work.

On this subject Lieutenant-Colonel Scriven, chief signal officer Department of the East, says:

> The experience of the past year has clearly shown the importance and value of the signal corps cable boat *Cyrus W. Field* now in commission. It has further demonstrated that this boat alone, especially in the stormy months of winter, is entirely incapable of maintaining the expensive cable systems already laid in harbors throughout the department from Portland, Me., to the capes of Virginia; the necessity for an additional cable boat for harbor work, and also for a larger seagoing ship, has become manifest.

Capt. Basil O. Lenoir, Signal Corps, who has most efficiently commanded the *Field* in its operations, reports that the condition of recovered cables emphasizes the futility of attempting to handle submarine cables with improvised boats and a force whose whole time is not devoted to the laying of cables, and the great danger of doing more harm than good. He adds:

> A list of cables recovered, found to be unserviceable and in need of much repair due to improper handling and laying, accentuate the uselessness of attempting to handle cables unless provided with the best of appliances and with a well-trained personnel. These can not be hired from civil life for coast cables; there being no demand in civil life, they do not exist. Therefore they must be trained especially for this business.

He further reports that the *Field* answers exceedingly well for a coast cable boat, but is hardly strong enough for outside trips in rough weather, as she is flat-bottomed, not being built to withstand the heavy buffeting of the rough seas. In one voyage between New York and Fort Monroe she was in danger of foundering in a moderate gale.

### FIRE-CONTROL SYSTEM FOR FIELD ARTILLERY.

Among developments in late years one of the most important as regards field artillery is the proper and judicious direction of its fire from under cover. The operations of the South African, and especially of the Russo-Japanese war, indicate the indispensability of a fire-control and fire-direction system which, if properly devised and operated, must greatly increase the efficiency of field artillery. Impressed with the importance of the subject, the Chief Signal Officer of the Army, in line with his action in 1898 as regards coast defenses, recommended that a similar system of fire control and fire direction be devised for the benefit of and operated by the field artillery of our Army.

This recommendation, viewed favorably by the General Staff and approved by the Chief of Staff, resulted in the reference of the question to the Light Artillery Board, to which were added as members Maj. Edgar Russel, Signal Corps, and an officer of the Ordnance Department.

In compliance with the request of Maj. E. D. Hoyle, Corps of Artillery, president of the Board, there was assembled at Fort Riley during the past summer a complete assortment of signal corps appliances for field communication.

While no definite action has been taken regarding the formal adoption of a fire-control equipment for field artillery, yet it is understood that among the material furnished were found methods and apparatus, which, on preliminary trial, proved entirely suitable for this important work.

The ability of the Signal Corps to thus quickly submit apparatus and supplies, thoroughly suited to this most modern development of artillery communications, accords with the policy of the Chief Signal Officer of the Army, which looks to his Corps keeping pace with modern progress, so that the most important discoveries may be utilized to the advantage of the Army.

### FIRE-CONTROL SYSTEM FOR COAST ARTILLERY.

With a view of cooperating with the artillery, officers of the Signal Corps took under consideration in 1897 the question of electric communications as an adjunct to the system of fire direction then under experiment. Acting on the recommendation of one of these officers, Col. James Allen, the Chief Signal Officer of the Army took steps in 1898 to extend the scope of the artillery work and by suitable electrical means to add a system of fire control.

The time was ripe for such development inasmuch as a disappearing type of gun was under installation at the most important coast defenses, while the enormously increased range of heavy guns had materially reduced the value of artillery fire by direct pointing.

Under these conditions indirect fire, that is firing without seeing the target, became the rule, and its suitable direction and control were matters of the utmost importance. The system evolved and now in operation consists: First, of the proper location of the hostile ship; second, of the prompt and continuous plotting of its movements, which enables its future location at a definite time to be accurately predicted; and third, the delivery of the fire of either one, or all, of the guns and mortars under the direction of the fire commander.

It has been the duty of the Signal Corps to devise and install instruments of accurate, reliable, and practically instantaneous transmission, without which such data would be in many cases practically worthless. By a suitable combination of bells, telephones, telautographs, and electric signals, a most efficient and reliable system has been evolved, its only defect, if any, being complexity. During the past summer, however, the systems installed in the artillery districts of Baltimore, the Chesapeake and the Potomac were operated by the Corps of Artillery with great, and it is thought almost constant, success. The position of the hostile ships were usually determined at intervals of fifteen or twenty seconds, and the methods of communication were such that every gun in extensive districts could be simultaneously fired in accordance with the information thus concentrated.

This has not been an easy task owing to the rapid advance in improvements and modifications of seacoast artillery. The question of fire-control communications, its methods and devices, has been thoroughly studied by Maj. Edgar Russel, acting under Col. James Allen's supervision, and it is believed that the Signal Corps has been entirely successful in dealing with these very important, complicated, and difficult interests.

In the early part of the fiscal year the Signal Corps had in process of manufacture quite large amounts of apparatus for installation in the important districts of the Chesapeake, the Potomac, and Baltimore, where the joint exercises of the Army and Navy were to take place during the summer of 1905.

Before adopting many of the important standard instruments, such as telephones, telautographs, and aeroscopes, the Chief Signal Officer of the Army had manufactured a complete system of improvised type apparatus for installation at Fort Monroe, Va. The Chief of Artillery approved of this installation, as it enabled the Board on Artillery Drill Regulations to determine its fitness, by actual practice, for acceptance or modifications, as the Board deemed best.

Necessarily the installation of a very complicated system at Fort Monroe was slow and difficult, as nearly all of the apparatus was tentative in form, thus necessitating much experimenting before its final adoption. It was not until April 19, 1905, that the report of the Board at Fort Monroe was officially received and approved by the Secretary of War.

Meanwhile the Chief Signal Officer of the Army was forced to earlier action, recognizing that otherwise the joint exercises which were to take place in the middle of June, 1905, would find the artillery entirely without apparatus or supplies for this purpose. Upon purely informal information he proceeded to give large orders for material and supplies for the installation of suitable necessary fire-control communications in these three large districts. If he had waited for the formal report of the Artillery Board, it would have been impossible to have completed the systems, as it requires from three to six months to secure the necessary apparatus.

Fortunately the type of apparatus finally approved was so nearly identical with that already installed that most of it is available for the permanent installations in these districts. In fact, although the installations are nominally temporary in character, it will be found that the substitution of permanent subterranean cables for the temporary aerial cables will in most cases convert them into a permanent system wherever the stations themselves are permanent structures.

Lines of improvements along which the most marked developments in fire-control apparatus have proceeded during the past year are as follows:

*Telephones.*—In telephones, the final adoption of an exceedingly efficient central energy system in place of the old local battery system. The advantages of such a system are apparent and need not be dwelt upon.

A large number of special types of telephones, all involving the same character of circuits, are necessary for the many special classes of service required. At emplacements the telephones are in water-tight iron boxes, which can be installed at any place desired, however exposed. At other stations there are plotters' sets, wall sets, hand sets, and head sets, while for searchlight and similar uses a portable telephone set has been devised. Several special forms of telephone switch boards have also been found necessary. It would be difficult to here give an adequate idea of the elaboration required.

*The telautograph.*—The telautograph, especially for emplacement use, has been so strengthened and improved that it is almost a new apparatus. The emplacement instrument is secured in a massive cast-brass case, practically air-tight, which can be hung anywhere in the emplacement, even on the gun carriage. The transmitter has been redesigned and now is supplied with a thin brass case instead of the wooden one formerly used, thus facilitating the radiation of heat evolved in the operation of this instrument.

The telautograph is necessarily troublesome to keep in order, but it remains the best of the visual communicating instruments which have as yet been brought to the notice of the artillery. Experimental apparatus now under test will, it is hoped, replace this expensive and complicated instrument.

*Time-interval clock and bell systems.*—The time-interval clock and bell systems have been evolved during the past year.

The clock is an accurate and beautiful piece of mechanism and has given excellent satisfaction.

The bells of the long-stroke variety seem to be very satisfactory. In order that the primary station may give the general alarm to various emplacements and secondary stations, in this circuit a strong pattern of vibrating interrupter is employed which operates the bells as if they were vibrating bells. Although apparently a trifling matter, this becomes important because of the liability of the ordinary vibrating bell, even when well made, to get out of order when exposed to weather. In this case the vibrators are all condensed into one, which is installed in the primary station, thus retaining the simplicity of the single-stroke bells at outside points.

*The distributing switch board.*—This may be described as the nerve center of the entire system, as to it is brought each of the wires of the fire command for the purpose of transposition of circuits in case of damage or for other reasons. This board was designed to meet the conditions imposed by the system devised by Lieutenant-Colonel Whistler at Pensacola, and, while providing for the transposition of power circuits, also secures the easy switching of telephonic and similar apparatus on the same board.

*Storage batteries, power boards, motor generators, and boosters.*—These instruments follow as nearly as possible the most approved patterns in commercial practice, with special reference to their durability and ease of repair. Very large quantities of supplies of this character are required in the operation of the electrical plants installed by the Signal Corps at artillery posts.

The *aeroscopes* are dial telegraphs operated on the step-by-step principle and are manufactured under patents of the Gray National Telautograph Company. These instruments are used at primary stations for giving visually data regarding atmospheric conditions and tide.

*Meteorological apparatus.*—This has remained the same in form as in previous years, the standard Weather Bureau thermometers, barometers, anemometers, and psychrometers being utilized. In addition the Signal Corps is having manufactured for the artillery an atmosphere board which gives graphic means of readily computing the data obtained from meteorological instruments.

*Cables for fire-control installations.*—The Signal Corps has labored earnestly to obtain the best types of cables which can be furnished by manufacturers. An important advance has been the substitution in many instances of paper lead-covered cables for rubber cables. This is a very great gain in compactness and is in line with the best commercial practice. Without this the enormous multiplication of conductors called for by the approved artillery schemes would speedily make many of the larger installations almost prohibitive in cost and weight of cables required.

*Miscellaneous.*—A large number of special forms of junction boxes, outlet boxes, cut-out cabinets, and similar accessories for taking care of cable terminals and other circuits have been worked out by the engineering department of the Office. When it is considered that the apparatus will be subjected to the rough conditions of military service, frequently operated by men of little or no experience in electrical matters, and in places inaccessible for repairs, it will be understood that the engineers of the Signal Corps have dealt with many difficult and unique problems.

## CIVILIAN ENGINEERS AND ELECTRICAL ASSISTANTS.

At the beginning of the fiscal year there were 2 electrical engineers, 5 assistant electrical engineers, and 5 electrical assistants employed. Due to the magnitude of the fire-control work initiated, it was found necessary to employ additionally 3 assistant electrical engineers and 9 electrical assistants.

Under the apportionment of funds recommended by the Chief of Artillery, extensive operations began in March, 1905, looking to the installation of permanent systems in the artillery districts of southern New York, eastern New York, Portland, Me., Boston, the Chesapeake, and Baltimore. As the work was initiated in the largest districts, the most active employment of engineers and assistants have been around New York.

On the whole, the work of these engineers and assistants during the year has been exceedingly satisfactory. A very careful method of selection has prevailed, and those appointed have, in general, been men of excellent technical attainments.

In New York, Mr. Townsend Wolcott, the senior electrical engineer, has had general charge of the work there centering, especially supervising the inspection of large quantities of supplies there purchased. Mr. Wolcott's attainments as an engineer, added to his long experience in the Signal Corps, have made his services most valuable.

Mr. R. A. Klock, electrical engineer, especially charged with fire-control matters at the Office of the Chief Signal Officer of the Army, has done a very large amount of important technical work, and has discharged his duties with the highest intelligence and zeal. His experience in fire-control matters has made his technical advice of the greatest value to the Office.

The engineers in charge of fire-control work in the artillery districts of the Chesapeake, Potomac, and Baltimore—Messrs. W. M. Chubb, J. R. Whitehead, and L. R. Krumm—during the joint exercises of the Army and Navy acquitted themselves with the greatest credit. There were few interruptions in the complicated systems at each place, and these were in almost all cases due to inexperience in the use of the apparatus rather than to any innate fault in the electrical installation itself.

## PROGRESS OF FIRE-CONTROL INSTALLATIONS.

The battle-exercise installations in the artillery districts of Baltimore, the Chesapeake, and the Potomac were in a considerable measure temporary, owing to the fact that very few of the approved stations existed. In the Potomac they can, however, be considered as practically complete. In the two other districts the permanency of installation depends largely on the replacement of the temporary aerial cables by subterranean cables.

Permanent fire-control installations are in progress in the artillery districts of eastern New York, southern New York, Portland, and Boston. They will be pushed to completion as rapidly as the work of other bureaus will permit.

Reconstruction or extension of existing temporary installation has been undertaken in the artillery districts of Narragansett, New London, and Pensacola.

In order to afford every artillery command opportunities for target practice a system of temporary fire control, largely telephonic, was devised which, meeting the approval of the Chief of Artillery, is now in course of installation in the artillery districts of Delaware, Charleston, Savannah, Key West, Pensacola, Puget Sound, San Francisco, and Columbia. The installation of three very important and expensive cables in the artillery district of Puget Sound connects Forts Casey, Flagler, and Worden, and thus renders the completion of the permanent installation a comparatively easy matter whenever the Signal Corps is advised that the approved stations are ready for fire-control installations.

A. W. Greely,
*Brigadier-General, Chief Signal Officer of the Army.*

The Secretary of War.

# REPORT OF THE CHIEF OF ARTILLERY.

# REPORT OF THE CHIEF OF ARTILLERY.

War Department,
Office of the Chief of Artillery,
*Washington, October 30, 1905.*

Sir: In compliance with the requirements of paragraph 294, Army Regulations, I have the honor to submit the following report:

### CHIEFS OF ARTILLERY.

Since the last annual report of the Chief of Artillery, which was submitted by Brig. Gen. J. P. Story, General Story has been promoted to major-general, and retired June 19, 1905, and Col. Benjamin K. Roberts, of the Artillery Corps, has been appointed brigadier-general and Chief of Artillery (June 19, 1905), and retired (June 20, 1905). Upon the retirement of General Roberts, on June 20, 1905, the undersigned was appointed Chief of Artillery.

To Major-General Story, while serving as brigadier-general and Chief of Artillery, is due the credit of having effected many improvements in the organization of artillery districts and in the instruction of the personnel, as well as the credit of having, in cooperation with the Chief of Engineers, the Chief of Ordnance, and the Chief Signal Officer of the Army, very signally advanced the work of installation of the material of the approved system of fire control; and, now that he has retired from active service, it is for the country a piece of great good fortune that, by reason of his membership on the board appointed by Executive order of January 31, 1905, to revise the report of the Endicott Board, Major-General Story's able services in connection with the coast defenses are to be continued.

### TARGET PRACTICE OF COAST ARTILLERY.

Attention is invited to the reduction in the allowance of ammunition for service practice with mortars and with guns of 8-inch, 10-inch, and 12-inch calibers during the current year as compared with the allowance during the year ending June 30, 1905. This reduction was necessitated by the limited appropriation, and it made necessary a reduction from three to two of the number of different times during the year of holding practice. It is considered important that future appropriations shall be sufficient to permit a return to the custom of holding practice three times each year.

The service practice during the year ending June 30, 1905, was very satisfactory, there being several records of 100 per cent of hits in a quarter's practice.

Subcaliber practice with guns during the year ending June 30, 1905, was very satisfactory, proving especially useful in training gunners and in affording opportunity for practicing fire control.

It is a matter of regret that the number of assistants in this office has never been sufficient to permit the assignment of one officer to the single duty of supervising all matters pertaining to target practice; for the preparation of regulations, the consideration of reported defects or recommended improvements in material, the timely allotment of ammunition, and the careful study of reports of practice afford sufficient work for the profitable employment of one officer's entire time. As matters have been, however, the study of reports of practice has been of necessity omitted, and the many valuable lessons to be deduced from such study have been lost.

### BOAT SERVICE.

There are three classes of service for which boats are required in connection with Coast Artillery in time of peace, viz, (1) for artillery purposes in connection with drill, practice, and administration, for a detailed statement of which purposes attention is invited to the last annual report of the Chief of Artillery; (2) for use in submarine-mine instruction, and (3) for ordinary freight and passenger service.

To provide for the service included in class 1 the Quartermaster's Department is doing all that appropriations permit; but, while these appropriations have made it possible to provide in some districts a service far in advance of conditions that obtained in former years, yet in other districts no improvement has been made, and in all districts the service is still inadequate. Boats for use in connection with drill and target practice are so essential to the efficiency of the coast defense that it is urged that increased appropriations be made.

To provide for the service included in class 2, four boats known as "torpedo planters" have been built and are now in use. Of these four one is required for exclusive use at the School of Submarine Defense and the other three are used in giving instruction in torpedo planting in the artillery districts of the Atlantic coast. One more torpedo planter is required for use on the Pacific coast, and it is recommended that provision for it be made without delay. Attention is invited to the fact that these boats, used for purposes of instruction in time of peace, will be available for use in planting torpedoes in time of war.

To provide for the service included in class 3 very little is being done, and attention is invited to this service as being of extreme importance to the health, the happiness, and the resultant efficiency of the personnel. In many of our districts there are 500 or more persons dependent upon boat passenger service, yet no provision whatever is made for a passenger service that will enable them to take advantage of the opportunities for evening recreation that are afforded in neighboring cities, because the limitations imposed by the endurance of crews and of the working life of boats render it impossible with the present numbers of crews and boats to extend the schedules into evening hours, whereas during the day the garrisons of the posts are at work.

### THE NUMBER OF OFFICERS ABSENT.

Of the 126 companies of Coast Artillery, 47 are without captains available for duty, and 31 are without the prescribed 2 lieutenants, making a total of 78 company officers absent from the coast artillery alone.

In the case of the Field Artillery it is the practice to assign captains who shall habitually be available for duty; however, 14 batteries lack the prescribed number of lieutenants, and all except one of the batteries that have the correct number of lieutenants available for duty have not lieutenants of the prescribed rank so available.

The subject of the absence of company officers is of great importance to the efficiency of the service, and it is recommended that remedial action be taken. Especially important is it to reduce the number of companies of Coast Artillery that are without captains. Attention is invited to the following statement of duties on which captains are at the present time serving. The total is 86 by reason of the addition of 39, the authorized number on the unassigned list, to 47, the number of companies whose captains are absent.

### DUTIES OF CAPTAINS NOT SERVING WITH COMPANIES OR BATTERIES.

Class A (33):
- 24 on staffs of artillery district commanders (28 are authorized by General Orders, No. 16, War Department, 1905).
- 3 assistants in the office of the Chief of Artillery.
- 3 in command of torpedo planters.
- 1 serving as librarian of the Artillery School, and as editor of the Journal of the United States Artillery.
- 1 serving as disbursing officer of the Torpedo Depot.
- 1 serving as adjutant of the School of Submarine Defense.

Class B (28):
- 11 students at the Artillery School.
- 10 students at the School of Submarine Defense.
- 3 students at the Staff College.
- 1 postgraduate student at the works of the General Electric Company, Schenectady, N. Y.
- 1 serving on the board for the preparation of Field Artillery Drill Regulations.
- 2 absent sick.

Class C (19):
- 6 instructors at the Military Academy.
- 6 instructors at the Artillery School.
- 2 instructors at the School of Submarine Defense.
- 1 instructor at the Staff College.
- 3 in the General Staff Corps.
- 1 military attaché.

Class D (6):
- 2 on recruiting service.
- 2 military instructors at colleges and universities.
- 1 serving with the Cuban artillery.
- 1 on duty with the civil government of the Philippine Islands.

The duties enumerated in the above statement have been divided into four classes. Class A, which accounts at the present time for 33 captains, includes duties which properly should be provided for by detail from the regular unassigned list of 39; and 39 is none too large a number for this purpose, because were the number of captains authorized for artillery district staff duty now available for such duty, and were a captain available for the fourth torpedo planter, Class A would account for 38 captains, while an increase of one in the number of torpedo planters is already necessary.

Class B, which accounts for 28 captains, includes duties of which the demands are so variable that special provision therefor could scarcely be made. Consequently 28 companies will have to be without captains; but the duties of this class are of short duration, so the captains will be absent for comparatively short periods.

Class C, which accounts for 19 captains, includes duties for which provision should be made in the same way as provision is now made for duties in the staff departments; for these duties require a definite number of officers that could be fixed by law.

Class D, which accounts for 6 officers, includes duties for which provision could well be made by the detail of officers of the retired list, where such detail is appropriate, and by the detail of lieutenants when the detail of retired officers is considered inappropriate. It is strongly recommended that the necessary legislative and executive action be taken to make special provision for the duties included in Classes C and D, and thus to reduce by 25 the number of companies of Coast Artillery without captains.

### FIRE-CONTROL EQUIPMENT.

The conditions governing the installation of the fire-control equipment are as follows:

It is estimated that the total cost of the installation will be about $7,000,000. Congress appears disposed to provide this sum, not at once, but by annual partial appropriations. It is therefore necessary to decide between the alternative courses of distributing the annual appropriation through all the harbors or of taking up the harbors separately for complete equipment. The latter course was adopted by my predecessor, and has been concurred in by the Chief of Engineers, the Chief Signal Officer, and the Chief of Ordnanee, and will continue to be the policy. In the meantime, however, it is necessary that all companies of Coast Artillery shall be able to drill and to practice as nearly as possible in the manner prescribed in the provisional drill regulations.

To meet the last condition, therefore, batteries sufficient to provide for all the companies of Coast Artillery have been selected to be provided with temporary equipments, these temporary equipments being obtained by modifying or extending existing improvised equipments to meet as nearly as possible the requirements of the adopted system, only such instruments of new types being issued as are necessary in place of unserviceable instruments of old types or such as are considered essential for purposes of instruction. When, in extending existing improvised equipments, additional construction work is necessary for even the temporary equipments, structures of the new types are erected upon the sites selected for use in connection with the permanent equipments; so that, when the latter are installed, the construction work done in providing temporary equipments shall not have been an additional expense.

Pursuant to the policy of providing temporary equipments, for every battery to which a company is assigned there is now provided, or there is being provided, either a horizontal or a vertical base line, and for every such battery for which a vertical base line only is provided datum points are established. Of the instruments included in the adopted system, plotting boards, position finders, deflection boards, and range boards are being issued for use in the temporary equipment. In the case of mortar batteries, however, plotting boards of an adopted type are not being issued, because the proposed type has not been approved in all its details.

For permanent equipment with the funds appropriated by Congress for use during the current year the harbors of Portland, Me., Boston, and New York have been selected, and it is expected that they will be completely equipped.

### JOINT EXERCISES.

Between June 11 and June 17, 1905, joint exercises of the Army and Navy were held in Chesapeake Bay, the problem for the Army being the defense of the artillery districts of the Chesapeake, of the Potomac, and of Baltimore. The value and the interest of the joint exercises this year were greatly enhanced because of the fact that they were the first held since the provisional drill regulations had been so far completed as to make possible a test of the details of the methods of fire control and direction therein embodied. Paragraph 4, item (d), of the revised rules for the exercises specifies "the best system of fire direction and control, especially with reference to improvements of adopted systems," as one of the subjects on which information was to be sought through the medium of the exercises, and there can be no doubt that, at the present time, information on no other subject relating to coast defense is to be compared in value with information on this subject.

But the disposition of the records and reports of the exercises prescribed by rule 56 is not conducive to an early possession of this information by those who are sufficiently intimately acquainted with the details of the provisionally prescribed methods of fire direction and control or with the details of the adopted installation to determine promptly what changes should be considered for incorporation in work in progress. It would seem to be appropriate that the Army reports previously to going to the War College, where the large problems only are considered, should pass through the office of the Chief of Artillery, where matters of detail could receive immediate consideration, with the view of effecting desirable modifications. As it is, this office, having obtained the reports, by courtesy, from the War College not until October 25, 1905, information as to the modifications which may have been recommended in the various reports, or which may have otherwise appeared from the reports to be desirable, is not yet available.

It is recommended that joint exercises be arranged for the summer of 1907, because their value to the Army is great. They afford the only opportunity that the artillery has for drilling and practicing with complete units higher than a battery, and even in some cases, as, for instance, a mortar battery or a gun battery of more than two emplacements, the only opportunity for drilling and practicing with a complete battery. A force of 1,754 officers and 41,833 enlisted men is required in order to provide a complete manning detail for our gun defense and our submarine-mine defense, so the available 525 officers and 13,734 men, when distributed proportionally among the several districts, as they are, except when certain districts are reinforced for joint exercises, are not sufficient to enable a fire-command drill or a battle-command drill to be held with all its units manned. Another benefit to be expected from future joint exercises is the development of convenient and suitable arrangements for quartering and feeding coast artillery troops in time of war. Heretofore in the exercises there have been so many improvisations necessary that the question of quarters and feeding has been permitted to settle itself on a maneuver basis, and has not been forced to a settlement on a simulated war basis.

Again this year the joint exercises emphasized the inappropriateness of the present company organization of the Coast Artillery for the work required of it. Each caliber of gun requires a gun section of composition peculiar to itself; and guns mounted on disappearing carriages require gun sections differing from the gun sections of the same calibers when mounted on nondisappearing carriages; while the number of guns of a particular caliber that may be mounted in one battery is not fixed. There is, then, little cause for surprise that in one instance during the recent exercises, as a result of numerous attachments and detachments, one battery as finally manned included officers and men of five different company organizations. A worse condition for the maintenance of discipline and the conduct of administration could scarcely exist. It is recommended that the present company organization be abolished and that the Coast Artillery be made by law to consist of specified numbers of officers, noncommissioned officers, graded experts, and privates, who shall be organized for purposes of administration into companies or other units of such strength in each grade as may be best adapted to the work required of the several units.

### PROVISIONAL DRILL REGULATIONS FOR COAST ARTILLERY.

The board on revision of drill regulations for Coast Artillery has very nearly completed its work, which comprised the preparation of drill regulations proper, position-finding service, manual for Coast Artillery, and battle tactics. The drill regulations proper and a portion of the manual have been printed in provisional form, and have been distributed. The position-finding service will be ready for distribution at an early date, and it is hoped that the battle tactics and the complete manual for Coast Artillery will not be long delayed.

In addition to the work of preparing the various regulations and manuals, the board has tested, and in some cases devised, instruments for use in connection with fire direction and fire control.

### THE ARTILLERY BOARD.

This board was first organized under the provisions of General Orders, No. 58, Adjutant-General's Office, 1900, and was composed of the commandant and the heads of the several departments; and this composition of the board, with the exceptions of a change in the recordership and of the addition of several members, continued until the publication of General Orders, No. 156, War Department, 1905.

The change in the composition of the board effected by General

Orders, No. 156 was rendered necessary by the burdensome duties under which the officers of the Artillery School, especially the commandant, were laboring; and since the work of the artillery board was in no way administrative, but wholly technical, there was no difficulty in severing the close relations existing between it and the Artillery School.

The amount of work done by the artillery board is very large. During the year ending June 30, 1905, 100 reports, varying in length from one to a hundred pages, were submitted by the board on subjects requiring much research, experiment, calculation, and discussion; and since the character of the work done by the board requires that the members of the board be not detached from fire commands and from batteries for the purpose of assignment to board work exclusively, it is very necessary that the board be granted every facility for the convenient dispatch of work. But at the present time the board is without clerical assistance, so it is recommended that a competent civilian stenographic clerk be engaged and be assigned to the board.

## THE TORPEDO BOARD.

The duties of the torpedo board are both technical and administrative, and its administrative duties are so intimately related with the School of Submarine Defense that in the reorganization of this board pursuant to General Orders, No. 156, War Department, current series, it was considered best, for the present at any rate, to designate some officers of the school as members of the board.

Plans for the submarine defense of all important harbors of the United States have been prepared by the torpedo board, and in its proceedings of July 31, 1904, for reference to which see the report of the commandant of the School of Submarine Defense for 1903–4, the board incorporated an estimate of the material and the personnel required to complete the scheme of submarine defense in accordance with those plans. It is urgently recommended that Congress be asked to appropriate the funds necessary for the purchase of the material and to enact the laws necessary for the provision of the personnel. By such means our coast defense can be strengthened more than is possible by any other one provision.

## THE PRESIDENT'S LETTER OF MARCH 13, 1905.

On March 13, 1905, the President addressed to the Secretary of War a letter in which he designated nine specific subjects relative to the organization and training of the artillery arm as matter for recommendation by the Chief of Artillery, and on June 17, 1905, my predecessor, Brig. Gen. (now Maj. Gen.) John P. Story, submitted a comprehensive report thereon.

While each one of the subjects designated by the President is of great importance, and while General Story's recommendation on each demands consideration and action, yet special attention is invited to the importance of taking action in accord with the recommendations looking to—

1. The separation of the Coast and the Field Artillery.
2. Provision for submarine mine defense.

3. An increase of the Coast Artillery for gun defense.
4. The proper organization of the Coast Artillery.
5. Adequate pay for technically skilled enlisted men of the artillery.
6. An increase of the Field Artillery.
7. The proper organization of the Field Artillery.
8. Examination for promotion of artillery officers of all grades.
9. Increased appropriations for target practice by both branches of the artillery.

The importance of preparing a perfect coast defense can not be too strongly emphasized. The function of the coast defense is that of an advance guard, a rear guard, or a line of outposts, and that it should be completely prepared in time of peace is as important as that a line of outposts should be maintained complete in the intervals between engagements. In fact, the line of outposts when attacked has an advantage that the coast defense has not. If unprepared, the line of outposts may, within limits, select its time and place of resistance by falling back, while still performing its function, whereas the coast defense can not in the least degree control the time of giving battle. At the time chosen by the enemy for attack, the coast defense must be prepared for victory or it will be destroyed, and its function will wholly fail.

In order to maintain the coast defense in a state of preparation for victory at a time of attack to be chosen wholly by the enemy, a complete manning detail of one relief is essential.

The force necessary for one complete manning detail for all the elements of our coast defense, including the 169 officers and the 4,970 enlisted men required for torpedo defense and power plant and searchlight service, is as follows:

| | |
|---:|---|
| 34 | colonels. |
| 30 | lieutenant-colonels. |
| 126 | majors. |
| 533 | captains. |
| 516 | first lieutenants. |
| 515 | second lieutenants. |
| 26 | master electricians. |
| 44 | sergeants-major, senior grade. |
| 87 | sergeants-major, junior grade. |
| 74 | electrician sergeants, first class. |
| 74 | electrician sergeants, second class. |
| 153 | engineers. |
| 153 | firemen. |
| 405 | observers, first class. |
| 331 | observers, second class. |
| 374 | plotters. |
| 47 | casemate electricians. |
| 45 | chief planters. |
| 45 | chief loaders. |
| 379 | first sergeants. |
| 379 | company quartermaster-sergeants. |
| 3,266 | sergeants. |
| 4,280 | corporals. |
| 782 | musicians. |
| 758 | mechanics. |
| 1,585 | cooks. |
| 28,546 | privates. |

The aggregates, therefore, required for one complete manning detail are 1,754 officers and 41,833 enlisted men, of which we have respectively 525 and 13,734.

But a comparison of the aggregate numbers does not reveal the extent of the disparity between what is required for a complete efficient manning detail and what we have. The pay of the individuals included in the aggregate is a question of importance, and when considered widens the disparity.

There is need in the artillery for trained specialists among the enlisted men, but there is at present no adequate provision for the pay of such specialists, the only provision at all for those who pertain to batteries being an additional $2 a month. Consequently, sufficient men capable of becoming specialists do not enlist, and of those who do enlist practically none reenlist, because the training they receive in the artillery that makes specialists of them also fits them for positions in civil life to which is attached much greater remuneration than they receive in the artillery.

The following rates of pay of the specialist grades enumerated in the manning table are recommended:

Master electricians, to be known as warrant officers, the pay and allowances of second lieutenants of artillery, not mounted.

| | |
|---|---|
| Electrician sergeants, first class, per month | $45 |
| Electrician sergeants, second class, per month | 35 |
| Engineers, per month | 65 |
| Firemen, per month | 30 |
| Observers, first class, per month | 25 |
| Observers, second class, per month | 22 |
| Plotters, per month | 25 |
| Casemate electricians, per month | 30 |
| Chief planters, per month | 25 |
| Chief loaders, per month | 25 |
| Noncommissioned officers, serving as gun commanders and gun pointers of permanently emplaced guns, per month | [a]5 |

At the present time there are enlisted specialists known as master gunners, for additional pay for whom no provision is made. These men are holders of certificates from the School for Master Gunners at Fort Monroe, and their certificates are evidence of their having acquired skill that makes their retention in the service especially desirable. Therefore it is recommended that the necessary legislation be enacted to give them $9 a month in addition to their pay, until such time as adequate pay for them might become available through the creation of the grades, with pay, recommended above.

### THE ARTILLERY SCHOOL.

Attention is invited to the report of the commandant of the Artillery School for the school year ending August 31, 1905, which report was submitted by the commandant direct to The Military Secretary, U. S. Army.

During the year 50 officers received instruction in the school, of whom 41 graduated, 6 completed the course, but failed to graduate, and 3, because of sickness or transfer, failed to complete the course.

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[a] In addition to their pay.

Relative to the failure of the 6 officers to graduate, special attention is invited to the remarks of the commandant upon the lack of coordination between the garrison school for artillery officers and the Artillery School, and between the Artillery School and the regulations governing the examination of artillery officers as to their fitness for promotion. To making subsequent promotion dependent upon success in the school course, objections that might be urged in the case of the Infantry and Cavalry School can not be urged in the case of the Artillery School; for not only is every artillery officer expected in time to take the course at the Artillery School, but also is the information given in the course there more essential for an efficient performance of daily duty, in peace as well as in war, than is the information given in the course at the Infantry and Cavalry School. An officer who fails in the course at the Artillery School should be required to take again, prior to his next opportunity for promotion, so much of the course as is included in the subjects in which deficiency caused his failure to graduate, and until he has satisfied the school board of his proficiency in those subjects he should not be eligible for promotion.

In the School for Master Gunners instruction was given to 21 enlisted men, of whom 16 received certificates of proficiency. And it is a pleasure for the Chief of Artillery to commend to the favorable consideration of Congress the recommendation of the commandant of the Artillery School relative to providing appropriate pay for these graduates and for the graduates of former years. But, because of the present small pay of first sergeants, and because of the belief of the Chief of Artillery that no enlisted members of a company should receive more pay than the first sergeant, it is recommended that the additional pay proposed for master gunners be $9 a month instead of $15 a month.

The report of the commandant of the school makes known that in one departemnt particularly, the department of electricity, the equipment is excellent, but the report also invites attention to the sad lack of library accommodations. The valuable books of the school library are now kept in a small wooden building, which is constructed of yellow pine and is accordingly very inflammable. It is recommended that a suitable library building be provided.

Another defect in the equipment of the school is found in the lack of adequate clerical assistance; and it is recommended that the request of the commandant for a stenographer be granted.

## THE SCHOOL OF SUBMARINE DEFENSE.

Attention is invited to the report of the commandant of the School of Submarine Defense for the year 1904–5, which report was submitted by the commandant direct to The Military Secretary, War Department.

In September, 1904, 10 captains of the Artillery Corps entered the school, and all were graduated on July 31, 1905, making a total of 35 graduates since the establishment of the school in 1901. In order that the classes of student officers may be increased from 10 to 20, additional quarters are required at Fort Totten, and it is urged that allotment of funds for their construction be made.

In the School for Electrician Sergeants 18 enlisted men successfully completed the course during the year, and all have been appointed electrician sergeants. As pertinent to the work of this school in supplying electrician sergeants for the Artillery Corps, attention is invited to the advisability of providing increased pay for that grade. Because of the fact that men already possessing the requisite knowledge and skill will not enlist for the pay of electrician sergeants, the School for Electrician Sergeants is the only source of supply, and because graduates of the school frequently find that with their newly acquired knowledge they can better themselves in civil employment, they do not reenlist, thus making it difficult, if not impossible, to maintain the supply. At the present time there are 15 vacancies in the grade of electrician sergeant, and that those vacancies should be filled and kept filled is most important. Some improvement in the maintenance of the supply of electrician sergeants is to be expected upon the completion of the new repair shop, because then it will be possible to give instruction to larger classes. But improvement from that cause, while it may fill vacancies, will not prevent them; so, by reason of continued change in the enlisted electrical personnel, the service will not receive benefit from accumulated experience.

The School of Submarine Defense should be supplied with a complete power and electrical plant, equipped with the best apparatus of latest design, in order that the student officers and the candidates for electrician sergeant may be instructed in the use and the care and preservation of the equipment of the most modern plants to which they may be assigned after leaving the school.

Attention is invited to the advisability, and even necessity, of enabling the authorities of the School of Submarine Defense to begin experiments with, and instruction in, the use of mobile torpedoes. For this purpose a special plant is, of course, necessary.

## THE FIELD ARTILLERY.

The necessity for legislative action separating the personnel of the Field Artillery from that of the Coast Artillery, and organizing the Field Artillery in units higher than a battery, was ably presented by my predecessor in his special report of June 17, 1905, to which attention is invited.

In the matter of the separation of the personnel of the Field Artillery from the Coast Artillery, nothing, of course, can be done prior to the enactment of laws; and it is urged that the necessary laws be enacted without delay, for constant interchange between two independent and distinct services is a source of loss of efficiency in both. The subject of coast defense with all its allied branches of scientific and technical knowledge affords sufficient employment for an officer for his whole lifetime; just as the art and science of maneuvering armies in the field afford a life's work for an officer of cavalry, Field Artillery, or infantry; and there is but little more in common between the Coast Artillery and the Field Artillery than there is between the Coast Artillery and either one of the other two branches; while between the Field Artillery and the other two branches of field service there is decidedly more in common than beween the Field Artillery and the Coast Artillery.

In the matter of organization a step toward improvement was taken when, by direction of the President, two provisional regiments of Field Artillery were ordered, in General Orders, No. 89, War Department, June 14, 1905, to be organized—one at Fort Riley, consisting of the Sixth, Seventh, Nineteenth, Twentieth, Twenty-fifth, and Twenty-ninth Batteries of Field Artillery, to be commanded by Col. Sidney W. Taylor, Artillery Corps, and the other at Fort Sill, consisting of the Second, Eighth, Thirteenth, Fourteenth, Fifteenth and Twenty-first Batteries of Field Artillery, to be commanded by Col. Walter Howe, Artillery Corps. But as these regiments, under the provisions of the order organizing them, are to be disbanded November 1, 1905, the step toward improvement is not long, its only attainment being a recognition of the fact that regimental organization for Field Artillery is necessary, and a certain amount of instruction in regimental organization obtained by the officers present.

The instruction obtained is particularly valuable, because the regimental organization has made it possible for the first time in our Field Artillery to employ modern methods of fire control and direction. And it was because of the great value attached to practical experience with those methods that led to the organization of the provisional regiments before their complete equipment with the new material required in fire direction and control was possible. Organizing the regiments this season, even though their equipment had to be delayed, or had in the end to be incomplete, was considered better than postponing the organization to next season.

For the organization of a regiment of Field Artillery six is the generally accepted number of batteries, but there is difference of opinion as to the number of battalions in which the six batteries should be organized. Because of this difference of opinion one of the two provisional regiments was organized with two battalions of three batteries each, and the other regiment with three battalions of two batteries each; and it is hoped that the work of the two regiments may afford data for a comparison.

The Field Artillery being a component of the mobile army, its strength is expressed in number of guns per thousand of infantry, and the ratio for our Army adopted by the General Staff is 3.35 guns per thousand of infantry, and not 2 guns per thousand of other arms, as has been stated in various official documents. The application of the adopted ratio to the present number of infantry regiments at their war strength shows that the Field Artillery lacks the number of guns necessary for the approved ratio, and this not considering reserve batteries and disregarding the fact that the number of batteries necessary for our first line of defense or offense in war ought to be fully provided and trained before war is upon us.

The importance of the Field Artillery has been demonstrated by the work it has done in the Russo-Japanese war, and the testimony of our attachés with both the Russian and Japanese armies is practically unanimous not only as to its importance but as to its increased efficiency caused by the development of modern fire-control methods when combined with an organization that permits a maximum number of guns to be directed by one man; for nothing has been more striking in the Russo-Japanese war than the success of artillery the units of which were organized in regiments against artillery the units of which exercised independence of action. But the modern methods of fire control, including the use of guns of increased range, of increased rapidity, and lacking recoil, as well as the employment of indirect fire and scientific methods of observation and communication, make it essential to effective unity of action that during peace most careful training be had in the organization that is adopted for use in war. And it is interesting to note that in order to provide the staff officers required for 12 of the 30 batteries of Field Artillery, when those 12 were organized as 2 regiments, it was necessary to detach the captains from all except 5 of the remaining 18 batteries; and that in order to provide the field officers for the two regiments it was necessary to withdraw post commanders and even district commanders from the Coast Artillery. Consequently it must be recognized that battery independence is impossible in peace as well as in war, because the withdrawal of captains from a majority of the independent batteries for the purpose of instructing the minority can be but a temporary expedient.

Therefore it is recommended that legislation be urged for—

1. The separation of the personnel of the Field Artillery from that of the Coast Artillery.
2. The organization of the Field Artillery in regiments of six batteries each.
3. An increase of the present number of batteries by 18.

## PROVISIONAL DRILL REGULATIONS FOR FIELD ARTILLERY.

The board for the preparation of Field Artillery drill regulations has completed, and there have been printed and issued in provisional form, parts relating to the soldier dismounted, the battery dismounted, firing instruction to include the battery, and mounted instruction to include the battery. Besides these parts the board has issued in tentative typewritten form parts relating to indirect laying, preparation of firing data and conduct of fire, battalion and regimental instruction (including fire direction), and ceremonies.

In addition to its work in the preparation of drill regulations the board has conducted important tests, and has aided in the organization and instruction of the provisional regiments of Field Artillery.

## THE FIELD ARTILLERY BOARD.

This board was first organized by General Orders, No. 60, Adjutant-General's Office, 1902, and was composed of the commanding officer of the battalion of Field Artillery and of the captains of the batteries of Field Artillery stationed at Fort Riley, Kans. And this composition of the board, with a few additions made necessary by extending to meet changed conditions the principle underlying the original composition, continued until the publication of General Orders, No. 156, War Department, 1905. The board as composed at the time of the issuance of General Orders, No. 156, War Department, 1905, was entirely too large to be well suited for the performance of its functions.

### MISCELLANEOUS.

Attention is invited to the remarks contained in the last annual report of the Chief of Artillery relative to the following subjects not elsewhere treated of in this report, which remarks are concurred in by the undersigned:

#### PAY OF STAFF LIEUTENANTS OF THE ARTILLERY.

There is a matter which is an unfair discrimination against the artillery. The law provides that the officers who belong to the battalion staff in the infantry shall have increased pay and allowances, but the law does not authorize that such pay shall be given to artillery officers performing the same duties. The organization in the Coast Artillery corresponding to the squadron in cavalry, or the battalion in infantry, is the fire command, and in the Field Artillery the battalion and their staff officers, who perform the same duties as in a squadron or battalion, should have the same pay and allowances that the infantry and cavalry enjoy. The discrimination noticed no doubt was unintentional, but there can be no remedy without legislation.

#### INSTRUCTORS AT ARTILLERY SCHOOLS.

It is my judgment that there would be a substantial increase in the efficiency of the Artillery School and the School of Submarine Defense if the heads of the departments of instruction were placed upon the same footing as the assistant professors at the Military Academy with respect to pay and allowances.

The officers who fill these positions are selected for their technical information and general ability, and they are charged with duties which are fully equal, if not of superior importance, to those of the assistant professors at the Military Academy, all of whom receive the pay of captains mounted. The hours devoted to instruction are in both schools much longer than at the Military Academy.

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#### ARTILLERY BANDS.

Each regiment of cavalry or infantry has its band, authorized by law. The artillery has now an organization equivalent to 13 regiments, but only 10 bands are allowed. This is an unfair discrimination against the artillery, which should be corrected by legislation.

Many Coast Artillery stations are on islands. As a rule they are less desirable than the cavalry or infantry stations of the country, and it would no doubt add much to the general content of the artillery soldier if he has his fair share of bands.

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#### THE WORK OF THE OFFICE OF THE CHIEF OF ARTILLERY.

When this office was established in 1901 it was organized as a part of the office of the Commanding General, and to it were assigned 1 assistant officer, 4 clerks, and 1 messenger. By increases from time to time since its establishment the number of assistant officers has been materially increased, but the number of clerks has remained very nearly the same. At the present time there are 4 assistants, 5 clerks permanently assigned, 1 clerk assigned from time to time, and 1 messenger.

The number of assistants and clerks has never been sufficient to enable the Chief of Artillery to have discharged each day the business appropriate to it, or even to have discharged at all business involving questions of greater individual importance than do the questions of daily routine, and the consequence has been that routine papers have lain for weeks and even months awaiting action, while some important matters, notably a scrutinizing supervision of target practice, have never received attention. And at the present time the need of assistants and clerks is particularly pressing, because of the great volume of work incident to the preparation of plans for the installation of the fire-control system in all fortified harbors of the United States. The supply departments, engineer and signal, have found it necessary to increase greatly the force of assistants, clerks, draftsmen, and others engaged in office work incident to this installation; and though an equal increase is not required in this office, yet a proportional increase that will enable this office promptly to discharge its function in the cooperation is absolutely necessary, and the lack of it has occasioned already the receipt in this office of letters from the heads of two supply departments inviting attention to the fact that delay in this office was not only suspending work by the supply departments, but also causing the Government to pay high wages to skilled laborers who were doing no work.

However, the recent increase by one of the number of assistants has already occasioned considerable improvement in the work of the office; and owing to the fact that because of the absence of certain permanent assistants, of whom one is still absent, it has been impossible yet to organize the office on a permanent basis with the increased number of assistants, it is hoped that the ultimate improvement may be even greater.

As in the case of the assistants, there has been recently an addition of one to the clerical force, but the additional clerk is not, it appears, permanently assigned, so it is impossible for the office to derive the full benefit that will arise from a reorganization of the clerks' office on a basis of an increased force, it being possible to do no more than to assign odd tasks to the additional clerk when he is available. It is recommended that the additional clerk, Mr. Purcell, be permanently assigned to this office.

Attention is invited to the fact that, although the services rendered by the clerical force of this office are fully as difficult and as important as those rendered by the clerical force of any other subdivision or office of the War Department, yet the salary attached to a clerical position in this office is much less than that attached to a similar position elsewhere; and this discrimination is aggravated by the fact that, owing to the small force, the duties are particularly onerous.

I desire to commend the individual clerks of the office for their care and zeal as well as for their efficiency.

Very respectfully,

Saml. M. Mills,
*Brigadier-General, Chief of Artillery.*

The Chief of Staff, U. S. Army.

# REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

# REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

War Department,
*Washington, October 24, 1905.*

Sir: Under the provisions of the act approved February 24, 1891, the Board of Ordnance and Fortification has the honor to submit, for transmission to Congress, its fifteenth annual report, covering the fiscal year from July 1, 1904, to June 30, 1905.

## CHANGES IN PERSONNEL.

There have been two changes in the personnel of the Board since the date of the last report. Maj. Gen. John C. Bates, Assistant Chief of Staff, succeeded Major-General Gillespie as president of the Board on the latter's retirement from active service June 17, 1905, being detailed by Special Orders, No. 149, June 28, 1905; and Brig.-Gen. Samuel M. Mills, Chief of Artillery, succeeded Major-General Story on his promotion on June 17, 1905.

The Board now consists of the following-named officers: Maj. Gen. John C. Bates, Assistant Chief of Staff; Brig. Gen. William Crozier, Chief of Ordnance; Brig. Gen. Alexander Mackenzie, Chief of Engineers; Brig. Gen. Samuel M. Mills, Chief of Artillery; Col. Ramsay D. Potts, Artillery Corps; Maj. Erasmus M. Weaver, General Staff; Gen. Thomas J. Henderson, civilian member, and Capt. Tracy C. Dickson, Ordnance Department, recorder.

## LEGISLATION.

The only special legislation affecting the Board is contained in the fortfications appropriation act approved March 3, 1905, making appropriation for continuing the work of the Board, as follows:

> To enable the Board to make all needful and proper purchases, experiments, and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implements and engines of war, and to purchase or cause to be manufactured, under authority of the Secretary of War, such guns, carriages, armor plates, and other war material as may, in the judgment of the Board, be necessary in the proper discharge of the duty devolved upon it by the act approved September twenty-second, eighteen hundred and eighty-eight; to pay the salary of the civilian member of the Board of Ordnance and Fortification provided by the act of February twenty-fourth, eighteen hundred and ninety-one, and for the necessary traveling expenses of said member when traveling on duty as contemplated in said act; for the payment of the

necessary expenses of the Board, including a per diem allowance to each officer detailed to serve thereon when employed on duty away from his permanent station, of two dollars and fifty cents a day; and for the test of experimental guns, carriages, and other devices procured in accordance with the recommendation of the Board of Ordnance and Fortification, ten thousand dollars, the expenditure of which shall be made by the several bureaus of the War Department heretofore having jurisdiction of the same, or by the Board itself, as the Secretary of War may direct: *Provided*, That before any money shall be expended in the construction or test of any gun, gun carriage, ammunition, or implements under the supervision of the said Board, the Board shall be satisfied, after due inquiry, that the Government of the United States has a lawful right to use the inventions involved in the construction of such gun, gun carriage, ammunition, or implements, or that the construction or test is made at the request of a person either having such lawful right or authorized to convey the same to the Government.

## GENERAL OPERATIONS.

Many tests have been conducted during the year, under the direction of the Board, of new designs of offensive and defensive appliances, both for seacoast defense and for the service of troops in the field. The principal work connected with the seacoast defense has included tests to determine the kinds of armor and their angular presentment against which projectiles having delay and nondelay action fuses should be used; the relative value of capped and uncapped mortar shells, when fired at striking angles of 50° and 75°; the distance from the unprotected hull of war vessels within which projectiles charged with high explosives must be detonated in the water to prove destructive, and the most efficient shape of shield for mounts for rapid-fire guns.

The principal work connected with the field service has included tests of intrenching tools and automatic pistols.

Much valuable information has resulted from these tests.

## SUBJECTS CONSIDERED.

A large number of projects and suggestions have engaged the attention of the Board during the year. A list of subjects considered will be found in Appendix B. Many appeals have been made for financial assistance in the development of designs for aerial navigation, but the Board has uniformly declined to give such aid until the design shall have been brought to a state of practical operation without the aid of the Government.

## FIRE CONTROL AND DIRECTION SYSTEM FOR SEACOAST ARTILLERY.

On April 6, 1905, the Board considered a letter from the Chief of Artillery, dated April 4, 1905, recommending a number of changes in the equipments for the system of fire control and direction for seacoast artillery approved by it on July 30, 1903.

The changes suggested rendered obsolete none of the material already procured, and all items of equipments except two—(*a*) an instrument for the direction and observation of fire at the battery commander's station and (*b*) a secondary observing instrument for battery primary stations—were recommended.

As the revised system received the approbation of the Chief of Engineers, the Chief of Ordnance, and the Chief Signal Officer, its adoption was recommended and a description thereof printed for confidential distribution.

### THE HUNDRED-GUN CONTRACT.

The fortification act of September 22, 1888, provided for contract guns in the following manner, viz:

> Whenever any party shall present for test a completed single-charge breech-loading steel gun of ten or twelve inches caliber, and of weight and dimensions to be prescribed by the Board, with the proper supply of ammunition for the test of the same, such gun shall, in the presence of the party presenting it, be subjected to such tests as the Board shall have prescribed; and should such gun be shown to the satisfaction of the Board by such tests to fulfill the requirements previously prescribed in respect to accuracy, range, power, endurance, and general efficiency, the gun and ammunition shall be paid for at a fair valuation, including cost of transportation, and contract shall be made at a price reasonable in the opinion of the Board, with the party presenting the best of such guns, for a further supply of similar guns, to be subjected to the usual service test before acceptance, the experimental gun and all guns purchased hereunder to be subject to inspection at each stage of manufacture, as follows, namely: For not less than fifty ten-inch steel guns; and for not less than fifty twelve-inch steel guns.

The Board on January 11, 1889, after careful consideration of the subject, prescribed tests, weights, and dimensions, as required by the provisions of the law for any guns which might be presented under the foregoing section, and, although the law did not require bids to be invited, prepared a circular letter, which was extensively circulated among such persons as were thought to be likely to present guns for test. No proposition was received from any party to construct a gun under this act.

This legislation was followed by the fortification act of August 18, 1890, which contained the following provision:

> SEC. 2. That the Secretary of War is hereby authorized and directed to purchase under contract, after due advertisement inviting proposals, and at prices which the Board of Ordnance and Fortification shall adjudge to be fair to the manufacturer and for the interest of the United States, twenty-five eight-inch, fifty ten-inch, and twenty-five twelve-inch guns, all of which guns shall be breech-loading single-charge steel guns, and of weight and dimensions to be prescribed by the Board, and shall fulfill the conditions hereinafter provided: *Provided*, That if two or more persons, citizens of the United States, submit proposals to furnish said guns, either in part or in whole, at prices not materially different from each other, contracts may be awarded in such proportion among the citizens submitting such proposals as the Secretary of War may direct. One type gun of each of the above-mentioned caliber, with the proper supply of ammunition therefor, shall be presented for test at such place and within such time as the contract shall provide, and shall be subjected to such tests in respect to accuracy, range, power, endurance, and general efficiency as the Board of Ordnance and Fortification shall have prescribed. All the other guns of each caliber, with the proper supply of ammunition, shall be delivered at such place and within such times as the contract shall provide, and shall be subjected to the ordinary service test of ten rounds with the full charge and weight of projectile, which shall develop the standard power prescribed for the gun. If the type gun sustains the prescribed test to the satisfaction of the Board of Ordnance and Fortification, it and each of the other guns which sustains the ordinary service test and the ammunition expended in such tests, shall be accepted under the contract. All guns manufactured under these contracts, including the type guns, shall be subjected to inspection at all stages of manufacture, and no change whatever shall be made in the material, mode of manufacture, or dimensions of the guns for service from those employed in the type gun without the approval of the Secretary of War. Payment for each gun and ammunition for testing same, including cost of transportation, shall be made upon the satisfactory completion of the prescribed test for that gun. All tests of guns shall be made in the presence of the Board and of the person presenting the gun, or his authorized agent, and due regard shall be paid to suggestions offered by him which respect the mode of making such test.
>
> That under the provisions of this section there shall not be expended or contract or contracts entered into involving the Government in an aggregate expenditure exceeding three million seven hundred and seventy-five thousand dollars, nor an

expenditure on the part of the Government in any one fiscal year in excess of one million dollars. And all guns and materials purchased under the authority of this section shall be of American manufacture and furnished by citizens of the United States.

As stated by the Board in its first annual report, the obvious purpose of this legislation seemed to be, first, to encourage and induce the establishment of at least one gun plant in the United States, in addition to the Government factories, capable of turning out 8, 10, and 12 inch steel guns by American labor and skill, from American materials; and second, to encourage and give opportunity to American inventive and mechanical genius, to bring forward new types of guns, subject to tests to be prescribed, to compete with the adopted Ordnance Department type of gun then being produced.

In this connection three functions were devolved upon the Board: The first, to prescribe the weight and dimensions of the several calibers of guns; the second, to adjudge whether the prices proposed were "fair to the manufacturer and for the interests of the United States," and the third, to prescribe and supervise the proper tests of the type guns which should be produced and offered.

On October 8, 1890, proposals were invited for furnishing these 100 guns under contract, in accordance with the act quoted; but although until December 18 was allowed for opening the proposals, none was received, manufacturers appearing to be unprepared to make bids, doubtless on account of the costly nature of the plant required, and, perhaps, on account of the amount of the appropriation being limited to $3,775,000.

By the fortification act approved February 24, 1891, the limit of expenditure was increased to $4,250,000, $50,000 being "reserved to cover all expenses other than powder and projectiles incident to the tests and inspection of the guns;" and also the Secretary of War was "authorized to contract thereunder for such less number of guns than one hundred as he may deem for the best interests of the Government."

After this supplemental legislation the Ordnance Department again, on May 8, 1891, advertised for proposals for the 100 guns.

It was found that the proposals of the Bethlehem Iron Company were so far below those of their competitors that they were practically the only ones before the Board for consideration, and by the terms of the contract entered into November 7, 1891, that company, now the Bethlehem Steel Company, agreed to deliver twenty-five 8-inch, fifty 10-inch, and twenty-five 12-inch guns for coast defense.

During the past year the delivery of all the guns under the contract has been completed. The Bethlehem Steel Company is now fully equipped to continue the manufacture of guns of large caliber should the occasion arise, thus fulfilling the purpose of Congress in the original legislation on the subject.

## EXPERIMENTAL GUNS AND CARRIAGES.

*The Brown 10-inch segmental-tube wire-wound gun.*—This gun was built under an allotment of $33,000 made by the Board September 15, 1896, and was completed in December, 1899, but owing to the delays on the part of the trustees of the Brown patents in designating a suitable powder, the preliminary firing tests of the gun were not begun until February, 1901. The first proof round with a pressure of 10,000 pounds developed a crack extending through the third chase hoop.

As this hoop is a thin covering used to protect the wire from injury, it was not believed that the defect had in any way weakened the gun, and on March 6, in the presence of the Board, three additional rounds were fired, with pressures ranging from 15,700 to 26,900 pounds. It being evident from these and subsequent rounds that with the special kind of powder determined upon the required velocities could not be obtained, the Board on April 6, 1901, granted the request of the trustees to increase the chamber capacity of the gun. This alteration necessitated sending the gun to the shops of the manufacturer. When returned, it was again mounted and firing tests renewed on October 28, 1901.

On the second round, with a charge of 175 pounds Du Pont smokeless powder for the 12-inch rifle, and a recorded pressure of 51,550 pounds per square-inch, the breech bushing, which was of cast steel and carried the breechblock and mechanism, was torn from the gun and blown backward several hundred feet. On October 31, 1901, the Board inspected the gun and found that, except as above indicated, it was uninjured. Permission was granted to remove the gun for repairs, with the understanding that the Government was to be put to no expense therefor.

August 12, 1902, the trustees again requested permission to further enlarge the chamber of the gun, and August 26 the Board granted this permission. In July, 1903, the gun was returned to the proving ground and mounted for continuation of test under a program of 100 rounds approved by the Board.

July 30, 1903, one shot was fired in the presence of the Board, with a charge of 100 pounds of smokeless powder. The breechblock was jammed by this shot and required considerable force to open it. Firings were continued from time to time until November, 1903, the breech mechanism continuously operating unsatisfactorily.

On November 4, 1903, the company requested permission, which was granted, to substitute a new breech mechanism, and the gun was removed from the proving ground in January, 1905, for the purpose. It has not yet been returned.

April 7, 1904, the company requested an additional allotment of $10,000 to cover extraordinary expenses incurred in the manufacture of the gun, but the request was not approved.

*Brown 6-inch segmental-tube wire-wound gun.*—The act approved June 6, 1902, providing for fortifications and other works of defense, including the armament thereof, contained a provision that, in the discretion of the Secretary of War, a portion of the money appropriated could be used for the purchase of material for a limited number of steel-wire seacoast guns. The trustees of the Brown wire gun patents made application to the Secretary of War to be permitted to furnish guns of their design under this clause.

The Secretary of War on July 21, 1902, referred to the Board for consideration and recommendation the question whether or not it was advisable to adopt as a type the Brown segmental-tube wire-wound gun, and to purchase or construct guns of that description for the service of the United States.

On August 7, 1902, the Board replied that "it is not at present prepared to recommend the Brown segmental-tube wire-wound gun as a type for the service." The Board did, however, recommend and the Secretary of War approved, an allotment of $25,000 to procure one

Brown 6-inch wire-wound gun with suitable mount, implements, and accessories, and 500 rounds of ammunition. This allotment was, on December 4, 1902, increased $16,000 upon the representations of the trustees as to the cost of manufacture, and the amount of ammunition to be furnished was reduced to 250 rounds. The aggregate amount allotted was $41,000.

The object of this purchase is to obtain a wire-wound gun of the latest design proposed by the Brown Wire Gun Company with a view to its test, and to determine whether or not other guns of the same design shall be procured as a part of the coast-defense system.

Test of the gun was commenced in the spring of this year and has been continued since under the direction of General Story, representing the Board, as explained under the heading of the Crozier 6-inch wire-wound gun.

*Crozier 6-inch wire-wound gun.*—The Board at its meeting on September 10, 1903, made an allotment of $11,000 for the construction of a wire-wound gun on the design of Gen. William Crozier, Chief of Ordnance. This gun differs in many respects from the Brown 6-inch gun, the most notable difference being the absence of the segmental wrapping of the tube, which is one of the features of the Brown system, and the object of the allotment was that a test of an additional system of construction might be made.

On June 2, 1904, the Board made an allotment of $16,537 to procure 250 rounds of ammunition for the test of the gun and at the same time approved program for its test and that of the Brown 6-inch wire gun. On September 19, 1904, $1,200 was allotted to enable the gun to be completed.

On February 14, 1905, General Crozier addressed the following letter to the Secretary of War, viz:

War Department,
Office of the Chief of Ordnance,
*Washington, February 14, 1905.*

The Secretary of War.

Sir: On August 7, 1902, the Board of Ordnance and Fortification made an allotment for the construction and test of a 6-inch Brown segmental-tube wire-wound gun, and on September 10, 1903, made a similar allotment for a 6-inch wire-wound gun designed by the Chief of Ordnance, the expenditure of each allotment to be made by the Chief of Ordnance. Both guns are now completed. The first is at the Sandy Hook proving ground where a few rounds have been fired from it, and the second is ready for shipment from the Watervliet Arsenal. The program for the test of the two has been adopted.

I have no financial interest in the gun of my design, having surrendered all rights therein to the public. I submitted the design for the reason that I thought that, in considering the question of the adoption of wire-wound guns for manufacture and use in the service, the United States should not be bound to a single design, controlled by private parties; but as the test of these two guns must be in some respects a competition, I have not thought it proper that I should serve, while considering them, as a member of the Board of Ordnance and Fortification, for which the test is to be made, and I have therefore requested the Board to excuse me from such service.

The test, however, is to be carried on by the Ordnance Department, of which I have the honor to be the Chief; and although all the firing of the Brown gun is to be in the presence of its representatives and in consultation with them, it is to be done by officers who are my subordinates and subject to my orders. This situation is not agreeable; and although it has been brought about by those concerned in the execution of their duty, I think it should be gotten away from if possible. I therefore recommend that the test be conducted by officers of the Artillery Corps, at such place as may be designated by the Chief of Artillery, to which the guns, mounts, and ammunition should be shipped, all expenses to be met by allotments by the Board of Ordnance and Fortification, which have been or shall be made, and the reports of the results of the test, together with the views of the testing board, to be submitted to the Board of Ordnance and Fortification through the Chief of Artillery.

Very respectfully,

William Crozier,
*Brig. Gen., Chief of Ordnance.*

The Secretary of War thereupon directed that the Chief of Artillery assume supervision of the test of the two guns. Upon General Story's promotion to a major-generalcy and retirement, the Secretary of War directed that he remain in charge of the conduct of the tests.

On February 14, 1905, General Crozier reqested the Board to excuse him from service thereon during the consideration of all questions relating to the tests of the Brown and Crozier 6-inch wire-wound guns, for the reason that he was the inventor of the latter gun, which request was granted.

To enable each of these guns to be subject to a 30-round rapidity test, $3,960 was allotted on May 4, 1905, for 60 rounds of ammunition.

Under General Story's direction the test of the two guns is proceeding at the proving ground as nearly simultaneously as possible.

*Bethlehem 6-inch rapid-fire gun and mount.*—On January 3, 1901, the Board made an allotment of $17,900 for the construction of a type 6-inch rapid-fire gun with pedestal mount, the design of the Bethlehem Steel Company, the gun to be capable of being fired at least eight rounds in one minute with a velocity of 2,500 feet per second, and to give a muzzle velocity of 3,000 feet per second with a projectile weighing 100 pounds, without excessive pressures.

During the past year the gun was tested and, having satisfactorily fulfilled the requirements, was accepted and turned over to the Ordnance Department.

*Bethlehem 5-inch gun on combination carriage.*—On May 4, 1900, the Board made an allotment of $14,000 for the construction of a 5-inch gun and carriage proposed by the Bethlehem Steel Company. The carriage is of a special type, intended to combine the characteristic features of both the disappearing and rapid-fire mounts. It was stipulated in the contract that before payment was made the gun must pass such firing tests as might be prescribed by the Board. The contract was dated July 2, 1900, and the gun and carriage were to have been delivered ready for test not later than July 2, 1901. Owing to the experimental nature of the carriage, however, its completion was greatly delayed, and it was not delivered at the proving ground until 1904. On August 24, 1904, $1,225 was allotted for procuring fifty rounds of ammunition for the test of the gun and mount. The test was completed during the year, and the material was accepted and paid for.

*McClean recoil-controlling device.*—On January 30, 1900, an allotment of $1,000 was made to cover the cost of construction and test of a recoil-checking device to be attached to the muzzle of a service 3.2-inch field gun, the device being the design of Mr. S. N. McClean. A 3.2-inch gun was loaned to Mr. McClean for his construction tests. No progress having been made in this direction, Mr. McClean has, at the request of the Board, returned the gun and carriage.

## AUTOMATIC AND SEMI-AUTOMATIC GUNS AND MOUNTS.

*Parker combination carriage for machine guns and ammunition cart.*—February 8, 1902, the Board made an allotment of $1,000 for the construction of a sample carriage for machine guns, the design of Capt. John H. Parker, Twenty-eighth Infantry. This allotment was subsequently increased by two others of $50 and $100 for the purpose of providing a pack saddle. The ammunition-carrying feature of the cart had also been developed to such an extent that the device was sent to Fort Leavenworth for comparative test with the Manning and Allen carts.

The Infantry Board reported that, in its opinion, the supply of ammunition should be considered as a separate proposition apart from the use of machine guns, and that the cart is not adapted to the supply of ammunition to the firing line.

On December 3, 1903, the Board recommended that the Parker carriage be not adopted as an ammunition cart, and on April 7, 1904, the tripod mount having been approved by the Secretary of War for use with automatic machine guns issued to cavalry and infantry, the Board recommended test of the Parker cart in competition with that mount.

On January 7, 1904, the allotment of $200, made October 1, 1903, for test of ammunition carts, was made available to put the Parker carriage in condition for further test. The cart was altered and repaired in accordance with Captain Parker's suggestions and then tested at Fort Leavenworth.

On February 2, 1905, the Board concurred in the conclusions of the infantry board that the Parker machine gun mount is not equal in efficiency to the tripod mount for machine guns, and recommended that no further test be made of it.

*De Knight automatic machine gun.*—August 7, 1902, the De Knight Gun Company exhibited to the Board its automatic machine gun, caliber .30. The company was requested to send the gun to Springfield Armory where it would be subjected to the usual tests at the expense of the Government.

The material was presented at Springfield Armory and on several occasions withdrawn from test for the correction of structural and other defects developed during the tests.

Test was finally renewed in February, 1905, 834 rounds being successfully fired, when the barrel burst and broke part of the water jacket and the breech casing, so that further test became impossible. As nearly as may be ascertained, 2,535 rounds had been fired through this barrel before it burst.

On February 28, 1905, the company requested an allotment to cover the cost of repairs to the gun. The Board, however, on April 6, 1905, made an allotment of $2,000 for the purchase of the gun and mount, with the proviso that the gun be properly repaired. Upon delivery of the gun its test will be resumed.

*Vickers-Maxim 1-pounder automatic gun.*—April 4, 1900, the Board made an allotment of $8,300 for the purchase of a Vickers-Maxim 1-pounder automatic gun and carriage and 2,000 rounds of ammunition. The material was tested in the fall of 1902, 966 rounds being fired under the program adopted. No action was taken on the material pending completion of test of the McClean gun.

*Hotchkiss 1-pounder automatic gun.*—On June 8, 1900, the Board made an allotment of $4,052.50 to purchase from the American Ordnance Company a Hotchkiss 1-pounder automatic gun and carriage, and on October 4, 1900, an additional allotment of $1,300 to procure the ammunition necessary for test of the gun.

The gun was delivered in November, 1900, and on March 6, 1901, was fired in the presence of the Board. After 186 rounds of the program had been fired, an offer was made by the Hotchkiss Company to exchange the gun and mount for one of the latest design, without expense to the Government. The offer was accepted and the material delivered. Test of the gun and mount has been completed, 714 rounds having been fired with the new gun.

*McClean 1-pounder automatic gun.*—In April and June, 1899, the Board made allotments aggregating $884.28 to reimburse the Navy Department for a 1-pounder rifle barrel and 500 rounds of ammunition furnished S. N. McClean, who had submitted to the Board a 1-pounder automatic gun and mount. On January 26, 1900, the Board witnessed a preliminary firing test of the gun, and on May 4, 1900, made an allotment of $3,000 for the purchase of 1,000 rounds of ammunition and to cover other incidental expenses of a thorough firing test of the equipment as soon as completed. In August, 1900, 500 rounds of ammunition was furnished Mr. McClean for use in the experimental development of his gun and the cost charged to the allotment of $3,000.

May 28, 1903, the Board witnessed an exhibition test of the gun at the Sandy Hook proving ground, at which time the Vickers-Maxim and Hotchkiss guns were also fired. The gun was then removed for repairs and was returned to the proving ground in March, 1904, when its test was resumed; 670 rounds were fired under the program approved by the Board, but as the elevating and traversing mechanisms were unsatisfactory in design, permission was granted on April 7, 1904, for the withdrawal of the material for the purpose of remedying the defects.

A supplemental program for completing the test of the gun was approved on June 2, 1904, when the gun was returned to the proving ground, but as the ammunition furnished by Mr. McClean was not suitable, further test was postponed. Suitable ammunition having been provided, the tests were resumed and completed. As several defects developed during the test which Mr. McClean claimed could be overcome, the Board on November 10, 1904, stated that if he would deliver at the Sandy Hook proving ground, free of expense to the United States, an improved 1-pounder automatic gun it would be tested, and made an allotment of $1,000 to provide the ammunition for its test. The improved gun is now undergoing test.

*Six-pounder semi-automatic guns and mounts.*—The Board at its meeting December 3, 1903, recommended the adoption of 6-pounder guns on pedestal mounts as a part of the coast-defense armament and, in order to determine the most effective guns and mounts, made the following allotments for the purchase of 6-pounder semi-automatic guns of nickel steel, having a muzzle velocity of 3,000 feet per second, with pedestal mounts, viz: Driggs-Seabury Ordnance Corporation, December 3, 1903, $3,600; American and British Manufacturing Company, May 5, 1904, $3,500; September 23, 1904, $142.42; Benet-Hotchkiss, December 3, 1903, $3,200; January 7, 1904, $590; March 3, 1904,

$80; United States Rapid Fire Gun and Power Company, April 7, 1904, $3,398.76; June 2, 1904, $483.38.

To provide for the test of these guns the Board, on May 5, 1904, made an allotment of $16,000 to cover all expenses incident to test, including the necessary ammunition.

The only gun and mount delivered are those obtained from the Benet-Hotchkiss Company.

*Seven and one-half-pounder semi-automatic gun.*—On February 2, 1905, the Board made an allotment of $6,000 for the construction of one 7½-pounder semi-automatic gun with long recoil, broad-tired field carriage, and limber to determine its suitability for use as a mobile coast-defense gun. The material is nearly completed.

*Fifteen-pounder semi-automatic gun and mount.*—March 3, 1904, the Board made an allotment of $10,000 for the construction of a 15-pounder semi-automatic gun and mount, to be made in accordance with designs submitted by the Chief of Ordnance. The allotment also covers the cost of 100 rounds of ammunition. To enable the gun and mount to be completed, an additional $2,000 was allotted on September 19, 1904.

Gun and mount were completed in May, 1905, and are now undergoing test.

## THE EMERY DISAPPEARING CARRIAGE.

The construction of the Emery 12-inch elevating carriage was authorized by a special act of Congress appropriating $130,000 for the purpose in February, 1893, and a contract was entered into in March of that year with Mr. A. H. Emery, though the actual work of construction was not commenced until 1896, when, by act of June 6, an additional appropriation of $10,000 was made for a loading apparatus for the carriage, and the inventor was relieved of the obligation of giving bond for the return of any money paid him should the carriage not prove to be successful. By act of May 25, 1900, the sum of $40,000 was added to the contract price of the carriage, and by act of March 3, 1903, the further sum of $40,000 was appropriated to enable Mr. Emery "to complete and erect the 12-inch carriage."

The total amount appropriated for this carriage and appurtenances is therefore $220,000, of which $135,656.98 has been paid. According to Mr. Emery's several reports, there were completed 10,971 parts of the carriage of an aggregate weight of 419,457 pounds.

The fortifications appropriation act approved April 21, 1904, contained a provision authorizing the Secretary of War, in his discretion, to close the contract under which Mr. Emery was making the 12-inch carriage, and to contract with him for either an 8 or 10-inch carriage to be furnished in place thereof, together with its foundations, erection, and preliminary tests ready for the proof tests by the Board, and to pay for this new carriage authorized the expenditure of the $84,343.02 remaining from prior appropriations.

In accordance with the provisions of the act referred to all work on the 12-inch carriage was suspended, and on June 13, 1904, a contract was entered into by the Chief of Ordnance with Mr. Emery for one 10-inch carriage of his design.

Considerable progress was made during the year in the construction of the 10-inch carriage.

## SHIELDS FOR COAST-DEFENSE GUNS.

On March 5, 1902, the Board made an allotment of $7,600 for the construction of a 4½-inch face-hardened steel shield of the design proposed by the Bethlehem Steel Company. It was at first intended to mount this shield on the 6-inch R. F. gun and carriage manufactured by the company, but in order to avoid possible damage to the 6-inch gun, an allotment of $258 was made on July 14, 1904, to enable a dummy gun to be used instead. On August 11, 1904, $883 was allotted to cover the cost of ammunition for test of this shield and on January 5, 1905, $2,015 was allotted to enable the mount, which was damaged during the tests, to be repaired.

June 25, 1902, the Board made an allottment of $10,640 for the manufacture of an experimental shield of a design submitted by the Ordnance Department to be tested under the same conditions as the Bethlehem shield.

Each of these shields was attached to a barbette carriage on which was mounted a dummy gun, and four 6-inch and four 5-inch projectiles fired at each. The angle between the dummy and attacking guns was the same for corresponding shots in each instance, so as to determine the relative resistance to penetration resulting from their different shapes. The results demonstrated the superiority of the design submitted by the Ordnance Department.

## ARMOR TESTS.

*Deck armor.*—March 6, 1903, an allotment of $20,000 was made for procuring armor plate, and to cover the costs of tests to determine at what angles of incidence projectiles of large caliber will "bite" and perforate the best quality of deck armor now being made. These experiments were proposed for the information of a board of officers engaged in revising the coast artillery drill regulations. The program provided for firing at 4½-inch nickel-steel plates with 8, 10, and 12 inch capped A. P. projectiles at varying angles of impact, and ending by firing a 12-inch capped A. P. shell charged with high explosives at an angle less than the biting angle, to determine the effect of the explosive on the penetration. The program also provided for continuing the experiments under certain conditions with 3-inch plates, and later was modified to repeat certain firings at 3-inch plates.

After the firing of the 12-inch shell charged with high explosive, the Board, on May 5, 1904, requested the Chief of Ordnance to submit an estimate of cost of a 7-inch Krupp plate, to be fired at with a 12-inch A. P. shell charged with high explosive, and on June 2, 1904, made an allotment of $6,000 to cover the cost of the latter test.

On October 6, 1904, a further allotment of $2,048 was made to complete the tests with 3-inch plates, the experiments having shown this to be advisable. The superiority of the capped projectile was conclusively shown and much other valuable information obtained.

*Capped and uncapped mortar shell.*—The Artillery Board at Fort Monroe having raised the question of the relative value of capped and uncapped shells in mortar fire, the Board requested the Chief of Ordnance to prepare a program to determine the relative value of the two projectiles.

On March 3, 1904, the Board made an allotment of $20,881.20 to cover the cost of plates, powder, projectiles, backing, and repairs for carrying out the program adopted.

The information obtained by these tests, which have been completed, will prove of valuable assistance in the preparation of battle tactics for seacoast artillery.

*Effect of high explosive shells on unprotected hull of battleships.*—On July 1, 1905, $15,000 was allotted for the construction of a target representing a compartment of a battleship and for the ammunition necessary for determining the distance from the ship within which high explosive shells must be detonated at different depths in the water to injure the unarmored portion of the hull. The tests are now being made.

*Tests with delay and non-delay action fuses.*—Allotments were made on October 6, 1904, of $19,082, on December 1 of $1,665.23, and on March 28, 1905, of $185.35 to cover the cost of a 12-inch armor plate and of the necessary ammunition for determining the relative effect against 12-inch armor of 12-inch A. P. shot and shell, charged with explosive D, with delay and non-delay action fuses when fired at different angles of impact. The tests have been completed and much valuable information obtained.

### TESTS TO DETERMINE LIMITING ANGLES OF TRAVERSE.

In August, 1903, the Board of Engineers recommended that tests be made to determine the limiting angles of traverse of coast-defense guns in respect to the blast effect on the personnel of adjacent emplacements.

After careful investigation to determine what data had already been obtained on the subject, the Board, on April 7, 1904, made an allotment of $1,620.60 for the purchase of 10 rounds each of 3-inch, 5-inch, and 10-inch ammunition, for the purpose of conducting tests, which have now been completed and the information desired obtained.

### RANGE FINDERS.

*Warner & Swasey range finders.*—March 3, 1904, the Board made an allotment of $5,000 for the construction of a horizontal base range finder of a design submitted by the Warner & Swasey Company. The instrument has a self-contained base line 25 feet in length. Tests made with a quarter-size model demonstrated its probable efficiency, but the allotment was made with the condition that no payment would be made for the instrument unless the results of its test are satisfactory to the Board. At the same time the company was requested to permit the test of the quarter-size model at Fort Monroe to determine its utility for identification purposes for rapid-fire guns at the shorter ranges.

On November 10, 1904, and January 5, 1905, allotments of $800 and $175, respectively, were made for the construction of a similar range finder having an 8-foot base for test by the Torpedo Board at Fort Totten to determine its suitability for use in the submarine mine fire-control system. Both instruments will be completed at an early date.

*Whistler-Hearn range finder.*—January 5, 1905, the Board granted a request of the Keuffel & Esser Company to have a depression position finder invented by Maj. G. N. Whistler and Capt. C. C. Hearn, of the Artillery Corps, subjected to test.

The instrument was sent to Fort Monroe for test by the Artillery Board and the Board for Revision of Coast Artillery Drill Regulations.

*Bethlehem range and position finder.*—June 2, 1904, the Board made an allotment of $5,550 for the purchase of a horizontal base range and position finder of a design submitted by the Bethlehem Steel Company. In this instrument information is sent from the secondary to the primary station by telephone, telautograph, or otherwise. It is claimed that the instrumental error due to lost motion will not exceed 0.001 of the range when tested with a base line not less than one-fourth of the range.

A model of this instrument was examined by the Board at the St. Louis Exposition, and it was understood that an improved instrument was to be constructed for test. It developed, however, that the company intended to furnish the exhibition instrument in filling its contract, whereupon the Board, on October 6, 1904, revoked the allotment and made a new allotment of $500 to cover all expenses incident to the installation and test of the range finder already constructed, which the company desired to submit for the purpose.

*Lewis depression position finder.*—May 1, 1902, the Board made an allotment of $2,000 for the construction of a modified type of the Lewis depression range and position finder, certain mechanical defects having developed in the continued use of the instrument in service.

The United States Rapid Fire Gun and Power Company, the manufacturers of the instrument, submitted drawings of the modified designs, which were approved by the Board, but under date of February 13, 1904, the company expressed a wish to further modify the designs and requested an additional allotment of $1,440 for completing the sample instrument. March 3, 1904, the company was requested to submit its latest design, upon receipt of which the Board would consider the question of making further allotment.

The design submitted was not considered by the Board equal to instruments already in service, and on May 4, 1905, the allotment was revoked.

Under date of May 9, 1905, the company submitted a claim for $2,237.45 to cover expenditures made in redesigning the instrument, which is now under consideration.

## AUTOMATIC PISTOLS.

At its meeting, April 6, 1901, the Board made an allotment of $15,000 for the purchase of 1,000 Luger automatic pistols of 7.65 millimeter caliber, for practical service test in the field.

The pistols were distributed to the cavalry and artillery with instructions to report on the arm. The reports varied so widely in the expression of opinion as to the merits of the arm that the Board, on April 3, 1903, arranged for exchanging fifty of the 7.65 millimeter for fifty 9 millimeter pistols, with barrels 3¾ inches long.

These pistols were sent to Fort Riley for test by the Cavalry and Field Artillery Boards.

A new model of the Colt automatic pistol having successfully passed the test at Springfield Armory, the Board, on January 11, 1902, made an allotment of $4,000 for the purchase of 200 of the latest model. These pistols were distributed to the service for practical test and report.

After considering the reports of the Cavalry and Field Artillery Boards by which the test was conducted, this Board in its proceedings of March 2, 1905, stated that "the adoption for use in the military service of either the Colt or Luger automatic pistols in the stage of development in which they have been tested is not recommended. The Board does not wish to be understood as condemning the automatic principle as such, but only as finding that its mechanical embodiment as presented for test does not give as satisfactory a pistol as the revolver."

## INTRENCHING TOOLS.

The Board has had before it for consideration a number of different designs of intrenching tools, in some of which several purposes were intended to be combined in one tool.

The whole question of bayonets and intrenching tools having been submitted to a special committee of the General Staff for consideration, all the designs in the custody of the Board, and the results of their test, were referred to that committee, which reported that none of them was suitable for adoption.

The designs reported upon were submitted by the following: Mr. O. S. Haukvik, Mr. John C. Michie, Mr. C. H. McClure, Gen. J. B. Babcock, and Capt. Cromwell Stacey.

## ARTILLERY DEVICES.

*Fergusson device for continuous laying of guns.*—November 5, 1903, the Board made an allotment of $250 for the construction and test of a device designed by Capt. F. K. Fergusson, Artillery Corps, for securing continuous laying of guns in elevation. On August 11, 1904, an additional allotment of $300 was made for completion of the device, which is now undergoing test.

*Davis elevating scale.*—July 30, 1903, the Board made an allotment of $100 for the construction of an elevating scale for disappearing carriages of the design submitted by Capt. H. C. Davis, Artillery Corps. The device was attached to a carriage at Fort Monroe and tested. Its adoption was not recommended.

*Rowan reflecting sight.*—August 11, 1904, the Board made an allotment of $250 for the construction and test of a reflecting sight in accordance with design proposed by Maj. Hamilton Rowan, Artillery Corps. December 1, 1904, an allotment of $85 was made to cover increase in cost of instrument, which has been sent to Fort Monroe for test.

*Isham recoil spade.*—October 16, 1902, the Board made an allotment of $250 for construction of a recoil device for field guns, the design of Mr. W. S. Isham. July 30, 1903, an additional allotment of $147.87 was made for the same purpose.

The device was tested in the spring of 1903, and as a result the Board on May 28 of that year made a further allotment of $50 to procure a somewhat wider and heavier spade to be attached to the same device. So far as the Board is informed, no further progress has been made.

## MISCELLANEOUS.

*Disappearing platform for searchlight.*—April 6, 1905, the Board made an allotment of $2,500 for the construction and erection of an experimental disappearing platform for a 36-inch searchlight of the design submitted by Capt. E. H. Schulz, Corps of Engineers. This device is intended to meet the need for masking lights, and also to prevent their location being discovered during daylight.

*Sunshades for azimuth instruments.*—At its meeting April 6, 1905, the Board made an allotment of $150 for the construction of two or more experimental sunshades for azimuth instruments to test their utility.

*Searchlight reflector.*—June 24, 1904, an allotment of $800 was made for the purchase and test of one experimental truck and searchlight reflector upon the recommendation of the Board of Engineers.

*Schulz blast meters.*—May 5, 1904, the Board made an allotment of $875 for the purchase of 25 blast meters of the design submitted by Capt. E. H. Schulz, Corps of Engineers, an instrument designed on hydro-pneumatic principles for measuring the effect of blast from seacoast guns. The devices were used in connection with tests to determine the limiting angles of traverse.

*Test of sensitiveness of fuses.*—The Chief of Artillery having raised the question of whether or not the fuses employed in 6 and 15 pounder shells were sufficiently sensitive to be operated by the thin plates used in the construction of torpedo boats, an allotment of $350 was made March 2, 1905, for the making of tests to settle the question. The tests showed that service fuses for these projectiles were operated by the thinnest plates used in torpedo boats.

*Tests to determine drift of mortar projectiles.*—April 6, 1905, an allotment of $750 was made, on the recommendation of the Chief of Artillery, for the purchase of the necessary ammunition for a test to be conducted at Fort Terry, N. Y., to determine the drift and probable error of mortar projectiles.

*Morris tube outfits.*—March 2, 1905, an allotment of $250 was made for the purchase of two Morris tube outfits and their adaptation to coast-defense guns for test in connection with the development of a system for training gunners.

*Subtarget gun machines.*—April 18, 1903, the Board made an allotment of $1,000 for the purchase of four subtarget gun machines, an instrument designed to aid in instruction in aiming small arms. One each of the devices was sent to Forts Riley, Sheridan, Leavenworth, and Camp George H. Thomas for practical trial.

Based on the reports received, certain modifications in the instrument were made on the suggestion of the Board, and on May 5, 1904, an allotment of $1,000 was made for the purchase of four machines of the new design. These have been sent to Forts Myer and Clark and to Plattsburg Barracks and Vancouver Barracks for further test.

*Meteorit.*—April 7, 1904, the Board made an allotment of $225 for the purchase of a quantity of meteorit, a new compound of aluminum, and for its manufacture into bits, canteens, cups, and meat cans for service test. On May 4, 1905, the manufacturer having failed to supply the quantity of meteorit ordered, the allotment was revoked.

*Schou smoke compound.*—February 5, 1903, the Board considered a formula submitted by C. V. Schou for making a smoke-producing compound. The Chief of Ordnance was requested to have prepared twenty-five 3-inch shrapnel charged with the Schou mixture for comparative test with a like number of shells charged with the service compound, in order that the relative value of the two might be determined.

As the Schou mixture failed to show any advantage over the service compound, the Board at its meeting December 1, 1904, recommended that no further tests be made with it, and at the same time made an allotment of $389.16 to reimburse the Ordnance Department for the cost of its test.

*Powell timing devices.*—April 18, 1903, the Board made an allotment of $800 for the manufacture of four timing devices of design submitted by G. H. Powell. The four devices having been practically completed, the Board on May 5, 1904, directed that a partial payment of 70 per cent be made to enable them to be completed. The contract for the devices was afterwards canceled, as Mr. Powell was unable, owing to his other duties, to satisfactorily complete the devices, and on June 1, 1905, the unexpended balance of the allotment was revoked.

*Powell gun-sling catch.*—March 2, 1905, the Board made an allotment of $150 for the manufacture of 150 gun slings with an improved catch or hook, designed by Lieut. Leighton Powell, Sixth Infantry. The slings are being manufactured at Rock Island Arsenal for test.

*Device to protect ear drums from shock.*—An allotment of $20 was made March 2, 1905, for the purchase of 12 pairs of a device invented by J. A. R. Elliott to protect the ear drums from the shock incident to the fire of coast-defense guns. Having passed satisfactory tests, the device was recommended for adoption for use by the Coast Artillery.

## RECOMMENDATIONS.

The Board renews its former recommendations that appropriations by Congress should be sufficient in amount to provide a reserve supply of ammunition of at least 100 rounds for each large-caliber gun as soon as mounted, as without an adequate supply of ammunition, it is needless to say, the armament of the coast defenses is useless.

In addition to the above-enumerated supply of reserve ammunition, there should be provided an ample allowance of ammunition for the annual target practice. A sufficient allowance for subcaliber and machine-gun practice should be continued.

Ample provision should be made for the purchase of range finders and other instruments for fire control, the installation of additional searchlights, the necessary cable for conducting electric power to the various parts of the fortifications and furnishing the essential lines of communication, and the material necessary for the mine defense of the principal harbors.

## ESTIMATES FOR THE COMING YEAR.

In order to carry on the work of the Board for the fiscal year ending June 30, 1907, an estimate of $5,000 has been submitted to the Secretary of War for transmission to Congress, and it is recommended that the appropriation be made in a single amount, as heretofore.

This is a reduction of $45,000 in the estimate submitted and half the amount appropriated for the present fiscal year, and is so made as the Board is of opinion that, with the amount estimated for and the funds already available, it will be able to carry on its experimental work without interruption.

## FINANCIAL STATEMENT.

In compliance with the act of February 24, 1891, which requires "a detailed statement of all contracts, allotments, and expenditures made by the Board," an exhibit, marked "Appendix A," accompanies this report, giving a detailed statement of the allotments and expenditures from July 1, 1904, to June 30, 1905, the period covered by this report. No contracts have been made by the Board during the fiscal year.

On July 1, 1904, the Board had on hand $216,384.70, and by the act of March 3, 1905, $10,000 was appropriated; to this is added the sum of $18,756.79 revoked from prior allotments, making the total available $245,141.49.

In the year past the Board has made allotments aggregating $76,492.93, leaving a balance June 30, 1905, of $168,648.56 for continuing the work of the Board, of which amount $14,710 is available for special purposes only.

J. C. Bates,
*Major-General, General Staff, President of the Board.*
William Crozier,
*Brigadier-General, Chief of Ordnance.*
A. Mackenzie,
*Brigadier-General, Chief of Engineers.*
Saml. M. Mills,
*Brigadier-General, Chief of Artillery.*
R. D. Potts,
*Colonel, Artillery Corps.*
E. M. Weaver,
*Major, General Staff.*
Thos. J. Henderson,
*Civilian Member.*

T. C. Dickson,
*Captain, Ordnance Department, Recorder.*

The Secretary of War.

# APPENDIX A.

TABLE SHOWING ALLOTMENTS AND EXPENDITURES MADE BY THE BOARD OF ORDNANCE AND FORTIFICATION FROM JULY 1, 1904, TO JUNE 30, 1905, INCLUDING STATEMENT OF UNEXPENDED BALANCES.

*Act of March 2, 1899.*

| | |
|---|---|
| Balance on hand July 1, 1904[a] | $10,000.00 |

*Act of August 18, 1890.*

| | | |
|---|---|---|
| 1905.<br>Apr. 6. | Revocation of unexpended balance of allotment of October 24, 1894, for purchase of field guns[b] | 4,710.00 |

*Acts of 1892 to 1904, inclusive.*

| | | | |
|---|---|---|---|
| | Balance on hand July 1, 1904 | $206,384.70 | |
| | Act of March 3, 1905 | 10,000.00 | |
| | | | 216,384.70 |
| | Revocations of allotments under these acts: | | |
| 1904.<br>July 15. | Allotment of November 17, 1896, for construction of Batson-Sawtelle road level | 200.00 | |
| Aug. 17. | Allotment of February 9, 1897, for typewriting | 4.26 | |
| Oct. 6. | Allotment of June 2, 1904, for Bethlehem horizontal base-range finder | 5,550.00 | |
| Dec. 7. | Reimbursement from appropriation "Mileage to officers and contract surgeons, 1905" | 1,438.63 | |
| 1905.<br>Feb. 2. | Allotment of December 1, 1904, for subscription to periodicals | 10.75 | |
| Apr. 6. | Allotment of January 18, 1890, for chassis for experimental firing | 42.97 | |
| | Allotment of January 3, 1901, for Bethlehem 6-inch gun on pedestal mount | 18.68 | |
| | Allotment of March 6, 1903, for cost of inspecting Brown 6-inch wire-wound gun | 1,178.77 | |
| | Allotment of April 18, 1903, for purchase of ammunition for test of new model Luger automatic pistol | 3,037.50 | |
| May 4. | Allotment of April 7, 1904, for purchase and manufacture of meteorit | 225.00 | |
| | Allotment of May 1, 1902, for construction of Lewis range finder | 2,000.00 | |
| June 1. | Allotment of April 18, 1903, for Powell experimental timing devices | 240.00 | |
| 26. | Allotment of March 6, 1903, for cost of inspecting Brown 6-inch wire-wound gun | 78.72 | |
| | Allotment of February 8, 1902, for cost of inspecting Bethlehem 6-inch gun | 21.51 | |
| | | | 14,046.79 |
| | | | 245,141.49 |

---

[a] Available for movable submarine torpedoes only.
[b] Available for purchases abroad only.

Allotments during the year:

| | | | |
|---|---|---|---|
| 1904. | | | |
| July | 1. | Construction of a floating target, ammunition, and all expenses of test of 12-inch torpedo shell | $15,000.00 |
| | 9. | Testing Kent vented muzzle for small arms, additional | 3.61 |
| | 14. | Alteration of dummy 6-inch gun for use in test of shields | 258.00 |
| | 20. | Stationery and miscellaneous supplies, December 31, 1903, to July 1, 1904 | 53.09 |
| | 22. | Rental of telephone, April 1 to June 30, 1904 | 6.25 |
| Aug. | 11. | Completion of Fergusson device for continuous laying of guns | 300.00 |
| | | Cost of ammunition and other expenses of test of two Bethlehem shields | 883.00 |
| | | Construction and test of Hearn ballistic computer | 350.00 |
| | | Construction and test of Rowan reflecting sight | 250.00 |
| | 24. | Ammunition and erection and test of Bethlehem 6-inch gun and mount | 1,225.00 |
| Sept. | 19. | Completion of Crozier 6-inch wire-wound gun, additional | 1,200.00 |
| | | Completion of 15-pounder semiautomatic gun and mount, with ammunition, of Ordnance Department design, additional | 2,000.00 |
| | 23. | Cost of 25 rounds of ammunition for shop test of American and British Manufacturing Company 6-pounder semiautomatic gun | 142.42 |
| Oct. | 6. | To complete tests with 3-inch plates in tests of deck armor | 2,048.00 |
| | | To cover all expenses of making comparative test of delay and nondelay action fuses | 19,082.00 |
| | | To cover expenses of installation and test of Bethlehem range finder | 500 00 |
| Nov. | 10. | Purchase of 8-foot-base Warner & Swasey Company's range finder | 800.00 |
| | | Ammunition and other expenses of test of improved McClean 1-pounder automatic gun | 1,000.00 |
| Dec. | 1. | Test of delay and nondelay action fuses, additional | 1,665.23 |
| | | Cost of test of Schou smoke compound | 389.16 |
| | | Rowan reflecting sight, additional | 85.00 |
| | | Annual subscription to periodicals | 50.00 |
| | | Installation and maintenance of telephone in office of recorder | 20.00 |
| 1905. | | | |
| Jan. | 5. | Warner & Swasey Company, 8-foot-base range finder, additional | 175.00 |
| | | Repairs to Bethlehem 6-inch gun mount to continue test of shields | 2,015.00 |
| Feb. | 2. | Construction of 7½-pounder semiautomatic gun, with carriage and limber | 6,000.00 |
| | 6. | Stationery and miscellaneous supplies, July 1 to December 1, 1904 | 33.10 |
| Mar. | 2. | Device for protecting the eardrums from shock, for test of | 20.00 |
| | | Manufacture of 150 gun slings with Powell catch | 150.00 |
| | | Purchase of two Morris tube outfits and adapting to seacoast guns | 250.00 |
| | | Test of sensitiveness of fuses of 6 and 15 pounder shells | 350.00 |
| | 7. | Completing 72 Babcock intrenching tools | 50.00 |
| | 28. | Increased cost of procuring bolts, etc., for test of fuses, additional | 185.35 |
| Apr. | 6. | Disappearing platform for 36-inch searchlight | 2,500.00 |
| | | Construction of two or more experimental sunshades for azimuth instruments | 150.00 |
| | | Ammunition for tests to determine drift and error of mortar projectiles | 750.00 |
| | | Purchase of De Knight caliber .30 automatic gun | 2,000.00 |

Allotments during the year—Continued.

| Date | Item | Amount | Total |
|---|---|---|---|
| 1905. | | | |
| May 4. | Additional ammunition for rapidity tests of 6-inch wire-wound guns | $3,960.00 | |
| June 17. | Rental of telephone | 25.07 | |
| 29. | Purchase of two Morris tube outfits, additional | 270.00 | |
| 30. | Expenses of the Board for the year | 10,298.65 | |
| | | | $76,492.93 |
| | | | 168,648.56 |

RECAPITULATION.

| | | |
|---|---|---|
| Balance on hand and appropriated during the year, general fund | $216,384.70 | |
| Balance on hand, act of March 2, 1889 | 10,000.00 | |
| Balance on hand, act of August 18, 1890 | 4,710.00 | |
| Allotments revoked | 14,046.79 | |
| Total available | | 245,141.49 |
| Allotments during the year | | 76,492.93 |
| Available for allotment | | 168,648.56 |

# APPENDIX B.

*Summary of subjects considered.*

| Subject. | Submitted by— |
|---|---|
| Experimental truck and searchlight reflector | Chief of Engineers. |
| Floating target for test of torpedo shell | Board of Ordnance and Fortification. |
| Alteration of dummy gun for test of shields | Chief of Ordnance. |
| Device for continuous laying of guns | Capt. F. K. Fergusson. |
| Ammunition for test of shield | Bethlehem Steel Co. |
| Program for test of 6-inch Bethlehem gun | Chief of Ordnance. |
| Ballistic computer | Capt. C. C. Hearn. |
| Reflecting sight | Maj. Hamilton Rowan. |
| Ammunition for test of 5-inch gun | Bethlehem Steel Co. |
| Omission of firing with uncapped projectiles in test of mortar shell. | Ordnance Board. |
| Program for test of torpedo shell | Do. |
| Allotment for completion of 6-inch wire-wound gun of Ordnance Department design. | Chief of Ordnance. |
| Allotment for completion of 15-pounder semi-automatic gun of Ordnance Department design. | Do. |
| Tests of deck armor, continuing | Board of Ordnance and Fortification. |
| Test of delay and non-delay action fuses | Artillery Board. |
| Horizontal base range finder | Bethlehem Steel Co. |
| Test of 6-inch rapid-fire gun | Do. |
| Self-registering target | C. W. North. |
| Revolver magazine | George J. Rowell. |
| Moving target | P. T. Buckley. |
| Reflecting sight | A. H. Eichhorn. |
| Combined coffee and soup can | W. A. Fowler. |
| Sight scope | W. D. Bowman. |
| Armored transport wagon | George H. Riley. |
| Armored car | A. M. Ignatius. |
| Vented muzzle for small arms | Perry E. Kent. |
| High explosive shell | John Blum. |
| Attachment for bridle bits | W. A. Fowler. |
| Automatic 1-pounder gun | S. N. McClean. |
| Armored road roller and armored car | P. J. Andersen. |
| Smooth bore rotating cannon | Wm. C. Heitkamp. |
| High explosive | B. M. Silverberg |
| Trunnion quadrant for mortars | Capt. S. F. Bottoms. |
| Camera obscura | C. F. Moon. |
| Electrocuting enemy | T. C. Philippus. |
| Captive balloon with mirrors | Woodson Mosley. |
| Guns and projectiles, plans for | O. W. Heatwole. |
| Wire and brush cutting projectile | Seth H. Violet. |
| Forbes range finder, test | Field Artillery Board. |
| Gun carriage | John Levey. |
| Modified Lewis range finder | U. S. Rapid Fire Gun and Power Co. |
| Submarine mine | Anthony Mazzalin. |
| Removing residue from guns | W. P. Scholl. |
| Disposition of obselete Ericsson torpedo | Capt. T. N. Horn, |
| Gunners' corrector | Capt. E. W. Hubbard. |
| Alteration of experimental shields | Bethlehem Steel Co. |
| Relocator | Capt. W. C. Rafferty. |
| Rafferty range finders, report | Artillery Board. |
| Semi-globular floating battery | Anson Phelps Stokes. |
| Ten-inch elevating carriage | A. H. Emery. |
| Long distance firing of seacoast guns | Chief of Artillery. |
| Disappearing searchlight | Capt. E. H. Schulz. |
| Exchange of reports of tests with Navy Department | Board of Ordnance and Fortification. |
| Range finder, 8-foot base | Warner & Swasey Co. |
| Halpine torpedo | E. B. Haymond. |
| Test of capped and uncapped mortar shell, report of | Ordnance Board. |
| Dirigible torpedo | John P. Lonquist. |
| Wire-cutting bayonet | William Klinefetter. |
| "Spitfire" bullet | William R. Gordon. |
| Automatic feed for small arms | A. R. Hinton. |
| Cartridge pouch and clip | Mills Woven Cartridge Belt Co. |
| Test of 1-pounder automatic guns, report | Chief of Ordnance. |
| Securing armor plates to backing by tap bolts | Board of Ordnance and Fortification. |
| Test of delay and nondelay action fuses, change in program | Chief of Ordnance. |
| Smoke compound, test | C. V. Schou. |

APPENDIX B.—*Summary of subjects considered*—Continued.

| Subject. | Submitted by— |
|---|---|
| Test of Brown 6-inch wire-wound gun, conditions of | Board of Ordnance and Fortification. |
| Aerial navigation | Calvin T. Freid. |
| Asks allotment to encourage cause of invention | Jacob von Provyen. |
| Noiseless gun | Anton Flierboom. |
| Increasing range of gun | F. M. Mitchell. |
| Accelerating projectile | J. M. Black. |
| Laying torpedo cables, appliances | B. Roberts. |
| Searchlight mechanism | M. C. Wilkinson. |
| Canteen filter | Mrs. C. F. Parker. |
| Repairs to Bethlehem 6-inch gun and mount | Chief of Ordnance. |
| Test of shields, report | Artillery Committee. |
| Rapid-fire test Bethlehem 5-inch gun, report | Do. |
| Deck armor tests, report | Do. |
| Do | Ordnance Board. |
| Captive balloon with mirrors | J. C. Jeffries. |
| Dirigible torpedo | État Libre du Counani. |
| Program for test of McClean 1-pounder guns | Chief of Ordnance. |
| Acceptance of Bethlehem 5-inch gun and mount | Do. |
| Whistler-Hearn range finder | Keuffel & Esser Co. |
| Jointed rifle | Alejandro Lopez. |
| Safety detonating fuse | Louis W. Burr. |
| Armored cloth | M. Abrams and Louis Shier. |
| Projectile and ground mine | A. H. Friedel. |
| Wire-cutting projectile | John Bigelow. |
| Caseless cartridge | W. E, Hayner. |
| Projectiles | Horace Blanchard. |
| Hollow bullet | G. W. Caldwell. |
| Combination field kit | George W. Norman. |
| Test of 60-inch searchlight | Capt. H. C. Davis. |
| Semi-automatic gun and mount, 7½-pounder | Chief of Ordnance. |
| Machine-gun mount | Capt. J. H. Parker. |
| Program of test of 15-pounder semi-automatic gun | Ordnance Board. |
| Method of protecting forts from tunneling | Arthur Lawrence. |
| Automatic pistol | Small Arms and Machine Factory Co. |
| Observation tower | Hugo Rohde. |
| Control of submarine mines | F. W. Schilly. |
| Singletree | Fr. Charles Goettert. |
| Perpetual-motion machine | Charles Gardner. |
| Engineer equipment pouches, reimbursement for | Chief of Ordnance. |
| Rapidity test of 6-inch wire-wound guns | Artillery Committee. |
| Device for protecting eardrums from shock | J. A. R. Elliott. |
| Gun sling catch | Lieut. Leighton Powell. |
| Device for training gunners | Capt. William Chamberlaine. |
| Test of sensitiveness of fuses | Chief of Artillery. |
| Automatic pistols, conclusions | Board of Ordnance and Fortification. |
| Dropping explosives from balloons | C. Bartholomew. |
| Searchlight system | W. O. Webber. |
| "Pan-angle telescope tubes" | Dana Dudley. |
| Decreasing report of firearms | J. M. Bridges. |
| Automatic ground mine | A. W. Riches. |
| Range finder for small arms | Alexander Kennedy. |
| Explosive shell | Isaac B. Wood. |
| Manufacture of smokeless powder | S. N. Wolff & Co. |
| Range and azimuth indicators | National Electrical Supply Co. |
| Experimental sunshades | Chief of Engineers. |
| Error of mortar projectiles, determinination of | Maj. G. N. Whistler. |
| Automatic gun | V. P. De Knight Gun Co. |
| Contract for timing devices canceled | Chief of Ordnance. |
| Synchronizing range finder arms, method of | Charles A. Junken. |
| Range finder | O. A. Ganser. |
| Electro-magnetic torpedo | F. C. Bargar. |
| Conditions for test of ordnance | Chief of Artillery. |
| Wire cutter | William C. Rice. |
| Modification of fire control system | Chief of Artillery. |
| Program for test of 6-inch wire-wound guns | Do. |
| Ammunition for test of 6-inch wire-wound guns, additional | Chief of Ordnance. |
| Cannon with flattened bore | T. Foster Burton. |
| Device for plane photography | Charles F. Walsh. |
| Dynamite shell | Elias Elmelin. |
| Portable telephone line | Mose Thompson. |
| System of operating torpedoes | W. M. Douglas. |
| Submarine mine | Anthony Mazzalin. |
| Range finder | Nicholas Tobin. |
| Torpedo tube | Herman Stelter. |
| Projectile | August Orshansky. |
| Electric cannon | Joseph Smolinski, for F. Krzanowski. |
| Entrenching tool | O. S. Haukvik. |
| Do | John C. Michie. |
| Do | C. H. McClure. |
| Do | Gen. J. B. Babcock. |

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